PAPER TRADE JOURNAL

Reg. U. S. Pat. Off.

PAPER

SIXTY-FIFTH YEAR

PULP

Established Feb. 17, 1899
Consolidated Nov. 16, 1899
with PAPER TRADE JOURNAL.

Vol. CIV, No. 6 Thursday, February 11, 1937

Established Sept. 21, 1910
Consolidated Feb. 19, 1925
with PAPER TRADE JOURNAL.

Predicts $47.50 Per Ton for Newsprint Paper

Charles Vining, President of Newsprint Association of Canada, Believes This Price Will Prevail In Near Future — Fair Price Necessary to Encourage Mills to Develop Normally— Expansion of Production Needed.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., February 8, 1937.—What is the economic price of newsprint today as compared with the actual price? Charles Vining, president of the Newsprint Association of Canada, in an address before the Canadian Club of Montreal, said that the economic price was $47.50 per ton, plus production cost increases.

Furthermore he went on to quote conditions from which the inference could be drawn that this price will prevail perhaps sooner than is generally believed. For instance, he said that the maximum production limit of all newsprint machines in Canada and the United States combined could not possibly produce more than half a million tons above their 1936.

Even this could not be done unless buyers placed their orders evenly throughout the year. The latter, he said, was necessary to prevent a seasonal shortage with a consequent spot market in which buyers would be bidding frantically for supplies. This might lead to an orgy of promotion and expansion that would injure all concerned.

What was necessary was a fair price that would encourage manufacturers to develop normally. In this connection he said that although there was a scarcity of newsprint in the closing months of 1936 there were newsprint machines lying idle that had a rated capacity of 350,000 tons.

Present Prices Too Low

At present prices for newsprint there was no encouragement to spend the capital necessary to put them into production, nor was there encouragement to sink capital in cutting pulpwood to feed them—a work, by the way, that had to be planned two years ahead. No sensible manufacturer, he said, would undertake these things without some inducement of possible profit, and that inducement has not existed.

That expansion of productive capacity will soon be needed, he admitted. The first method should be by improvements of existing machines, a method of providing very substantial new capacity with no construction of new mills or machines. Low price levels would delay such improvements, and newsprint buyers should recognize as a necessity in their own interests the establishment of a price for newsprint sufficient to induce and permit improvements.

An Embargo on Pulpwood Exports

Something of what Premier Duplessis meant last week, when he told members of the Canadian Pulp and Paper Association that the Quebec Government planned to apply the same regulations to pulpwood cut on freehold land as apply to lumber on Crown land, has been revealed by an interview given by the Premier in Montreal. The Government, he intimated, intended to put an embargo on the export of pulpwood.

"All pulpwood cut in Quebec," he said, "should be processed here. Quebec should derive the full benefit of this industry, whether the raw material is converted into newsprint, celanese, sulphite pulp or the manufactured product."

There is some speculation as to how the Government proposed to effect the embargo. Under the British North America Act the federal government has full power over import and export trade. Crown lands belong to the Province, and in respect to pulpwood cut on Crown lands, the Provincial Governments, when they grant concessions, insert a clause in the agreement to the effect that the pulpwood shall be manufactured in this country. This has the effect of an embargo. How they can exercise similar restriction over the private property of individuals or corporations remains to be seen. It may be that a move will be made to get the federal government to apply an embargo, and it may be that an amendment to the British North America Act will be sought to enable this and other provinces to do so.

The situation is complicated by the fact that many farmers derive a substantial part of their income from the sale of pulpwood from their lands, and complain that they would be at the mercy of local mills were it not possible to sell to foreign buyers.

The forest domain of the province of Quebec covers 165,863,680 acres, of which 10,937,000, or an area of 17,090 square miles, consists of privately owned forests.

Price Bros. & Company Reorganization

Two special general meetings of the shareholders of Price Bros. & Co. will be held on March 1 to consider the new plan for the re-organization of the company.

The present capital structure consists of $11,061,600 of

(Continued on page 51)

Wisconsin Mills Solving Fiber Waste Problem

More Than Two-Thirds of Badger State Paper Plants Have Reduced Waste Below 2 Per Cent — Progress Towards Further Reduction Being Made — Save-All Systems Installed In More Mills Providing Further Control.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., February 8, 1937—Wisconsin mills are gradually solving the problem of fiber waste. A survey conducted by the State Board of Health shows that more than two-thirds of the mills have reduced waste below two per cent. The state average of fiber loss has been cut in two years from 2.9 per cent to 2.6 per cent, and progress towards further reduction is being made. Save-all systems are being installed in more mills, and will provide further control.

Use of the Howard process to reclaim sulphite waste is also being utilized to advantage, the board finds. The full-scale chemical reclamation plant of the Marathon Paper Mills Company at Rothschild is held up as an example of what can be accomplished.

Dr. C. A. Harper, state health officer, has issued a statement commending the mills for their efforts to reduce stream pollution, and believes the Wisconsin record is now below that of any other state.

New Process for Artificial Leather

A patent has been granted to Ernst Mahler, vice-president of the Kimberly-Clark Corporation, Neenah, Wis., and John B. Catlin of Appleton, Wis. on the invention of a process and apparatus for manufacturing artificial leather. Eight features were approved. The process involves the continuous passing of a bat of creped tissue through a compression zone. The tissue is saturated with a filling and binding liquid, and is compressed and dried to form a product that has all the appearances of leather, and a great deal of its durability as well. Commercial rights have been assigned to the Paper Patents Company of Neenah. The two men made application for the patent in July, 1935.

Frank J. Timmerman Honored

More than 150 paper mill officials of the Fox River Valley attended a dinner at Green Bay in honor of Frank J. Timmerman, veteran mill manager of the Northern Paper Mills, Green Bay, Wis. He is president of the American Pulp and Paper Mill Superintendents Association. M. J. Ketter, general superintendent of Hoberg Paper Mills, Inc., was the chairman. Speakers included J. M. Conway, president of the Hoberg company, and John V. Diener, mayor of Green Bay.

Thilmany Increases Wages

An increase in wages of five per cent was announced last week by the Thilmany Pulp and Paper Company, Kaukauna, Wis. The new schedules were placed in effect immediately, and will benefit 750 employees.

News of the Industry

Mills of the Wisconsin River Valley will pay water power tolls of $104,281 to the Wisconsin Valley Improvement Corporation for the last six months of 1936. These are levied to pay the cost of maintaining uniform water flow through a series of control dams on the upper river. Tolls which are to be approved by the Wisconsin Public Service Commission include: Rhinelander Paper Company, $3,398; Tomahawk Kraft Paper Company, $6,155; Wausau Paper Mills Company, $5,496; Marathon Paper Mills Company, $6,223; Mosinee Paper Mills Company, $4,963; Wisconsin River Paper and Pulp Company, $6,443; Whiting-Plover Paper Company, $274; Consolidated Water Power and Paper Company, Stevens Point dam, $5,220, Biron dam, $7,132, Wisconsin Rapids dam, $9,598; Nekoosa-Edwards Paper Company, Centralia dam, $4,061, Port Edwards dam, $4,893, Nekoosa dam, $5,717.

An increase of taxes from one-tenth to two-tenths of a mill will be sought of the Wisconsin Legislature at its present session by conservation groups. The added funds will be used to create more state forests, and carry on a wider program of reforestation, as well as to provide better facilities for fighting forest fires.

During 1936, the state spent more than $500,000 for fighting forest fires, according to H. W. MacKenzie, director of the conservation department. Protection is given 12,000,000 acres of forest land in ten forest districts. Ninety-two per cent of the fires burned less than ten acres each, due to the effective means of detecting and combatting them before they gained headway. In one day last August, the report shows, 78 new fires were reported, and 56 old fires were still burning.

Thursday, May 20, has been set as the date for the annual Fox River Valley Safety Council meeting, to be held at Oshkosh, Wis. E. S. Schrank has been appointed general chairman, A. M. Bleyer, secretary, and Herbert Witzel, treasurer. They all reside in Oshkosh. The program will be divided into sectional meetings, with one devoted to safety in pulp and paper mills.

Real estate valuation of the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., has been reduced from $3,836,875 to $3,591,225 under a reassessment of the city made by the Wisconsin Tax Commission. Its personal property is raised from $402,000 to $540,000. The company protested its assessment last year as being too high.

Dividends of six per cent have been distributed to members of the credit unions of the Marathon Paper Mills Company, Rothschild, Wis., and the Lakeview Credit Union of Neenah, Wis. Both showed satisfactory earnings. Norman Dumdei was reelected president of the Marathon union, and Robert Corey was elected president of the Neenah union. The credit unions are maintained by employees as a source of small loans to workers.

Final account has been made by the Winnebago county court at Oshkosh, Wis., of the estate of Imogene S. Price, widow of the late Harry Price of the Kimberly-Clark Corporation, Neenah, Wis. The estate was valued at $504,140.63, in addition to the Price home. After specific bequests have been made to relatives, the residue of the estate goes to a daughter, Martha Price Gunn. One-half of the personal property is placed in trust with the First Trust Company, Oshkosh, Wis.

Dr. Harry F. Lewis, dean of the Institute of Paper Chemistry, Appleton, Wis., has returned from a trip during which he visited 28 educational institutions in the middle west and east, where he interviewed applicants for admission to the Institute. On a previous trip to the western and southwestern states, he visited 33 colleges and universities.

In any Language

STONITE*

*(Ebonite and Granulated Stone Composite U. S. Patent 1,787,890 Re. 18,111)

Means Better PRESS ROLL *Performance!*

A 238-inch STONITE Top Press Roll now operating in a southern mill.

Over a thousand STONITE top press and smoothing press rolls in service throughout the world are demonstrating beyond question the superiority of this patented Stowe-Woodward compound. These mills make every grade from board to tissue. STONITE Rolls help them produce paper with a better, more uniform finish, help them eliminate pick-up and breaks, make the presses behave better than they have ever behaved before. If you wonder why so many mills are putting in STONITE Rolls, may we show you? Write for the complete story.

STOWE-WOODWARD, INC.

NEWTON UPPER FALLS • MASSACHUSETTS

NEW YORK OFFICE • WOOLWORTH BUILDING

Makers of WHITE STAR *Rubber Covered Rolls,* TANNITE *Couch Rolls* STONITE *Top Press and Smoothing Rolls—All by the* COREWELD *Process*

Paper Business Continues Active In Chicago

Demand for Book Papers Exceptionally Heavy—Cover Papers Exhibit Strong Undertone—All Grades of Kraft Paper In Excellent Request—Newsprint and Ground Wood Papers Steadier — Paper Stock Moving Freely.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., February 8, 1937.—Those who confidently expected a lull in the Chicago paper market are still looking for it. The normal levelling off of markets following a pronounced rise is absent as well as any levelling off in demand. Prices continue firm and decidedly on the upward side while demand is exceedingly good—even sensational in some quarters—in the entire industry. Some possibility of slight let downs in sulphites was eliminated at the close of the first day of the week according to local firms who reported a continuation of last week's business. Book papers had an exceptionally good week while there were reports that the cover paper market was also expected to make higher ground in the near future. Krafts of all grades continued in good demand with scarcity of raw materials and improved business combining to put the mills far back in their production schedules. Groundwoods shared in the widespread forward movement during the past five days while the pinched supply in the newsprint market was also found worthy of considerable comment. Waste papers were active but none of them specifically reached higher ground.

An indication of the strong upward trend in paper prices is received through a glance at the most recent price list change sent out by the Swigart Paper Company as of February 4. The corrected price sheets cover book papers, coated covers, sulphite bonds, ledgers, mimeographs, writings, gummed papers, envelopes, wrapping, strawboard and chipboard and other lines. Swigart adds that "prices have been advanced on other lines such as text papers, announcements, etc. Price sheets for these changes are being prepared as quickly as possible and will be mailed without delay."

Renaissance of Credit

The Fine paper merchants Division has scheduled a series of meetings of the credit men of the industry during the forthcoming Seventh Credit Congress of Industry, which will be held in conjunction with the 42nd Annual Convention of the National Association of Credit Men, at the Hotel Stevens, Chicago, Ill., June 21 to June 25, 1937.

This group of credit executives is headed by George G. Marguerat, Butler Paper Company, Detroit, Mich., as national chirman, and Samuel Wulfson, Berkshire Paper, Inc., Chicago, Ill., and G. J. Whinnery, McClelland Paper Company, Minneapolis, Minn., as national vice-chairman. In addition to a very constructive program pertaining to the credit ills of the industry, there will be roundtable discussions of their experiences in business with the recent enactments of the Robinson-Patman and the Social Security Acts. This information will not appear in book form for many months thereafter.

According to Mr. Marguerat, he anticipates the largest attendance in the history of the Fine Paper Merchants' Division, and urges every firm in the industry to send their credit executives and make preparations now to attend. Credit representatives will make many valuable contacts during these meetings, as well as discussing many helpful suggestions of modern credit practices and procedures, which are so important to management, and Mr. Marguerat will welcome their communications.

Waste Material Dealers to Meet

The National Association of Waste Material Dealers, Inc., is making extensive plans for a record breaking convention and annual meeting to be held at the Hotel Sherman, Chicago, March 15, 16 and 17. With Chicago the headquarters for the entire waste material industry during the week, several local executives are handling many important details of the program. Louis Lippa, Apex Smelting Company, is chairman of the convention and banquet arrangements while Benjamin Friedman, as vice chairman, is assisting in making the social arrangements. The NAMWD Club, a social organization within the national body, is the hub of the social activities. The Waste Paper Institute is to have a prominent part in the three day program which will be climaxed by the 24th annual banquet to be held on March 17 at the Hotel Sherman.

News of the Industry

The Illinois Legislature this week finally got down to business and reviewed 96 bills introduced. Among them were eight hour day for women bills as well as five day week legislation on which labor is sponsoring very actively. Illinois has not as yet enacted a State unemployment compensation insurance act to conform to the national law and the provisions of the State act are causing some concern for local paper manufacturers, wholesalers and jobbers coming under the Act. Efforts to place the Illinois tax at 1.9 per cent to cover the Federal assessment and to put in force a workable merit rating plan designed to encourage those with good employment records are featuring conferences which are taking place prior to the final drafting of the State bill.

W. E. Amberg, Chicago, is listed as the assignor to the Universal Paper Products Company, Chicago, of a patent on a paper container. The new container is reported as an improved type of cone-shaped paper cup to be utilized in the dispensing of water, soda fountain drinks, etc.

The Freas and Thelco Constant Temperature Laboratory Equipment is now being solely manufactured by the Precision Scientific Company of 1730 North Springfield Avenue, Chicago, according to a recent announcement made by that company.

C. I. Kentnor has recently been appointed advertising manager of the Seminole Paper Corporation of Chicago. Mr. Kentnor, for some years identified with Procter & Gamble, has more recently been actively engaged in sales and promotional work for the Seminole Corporation.

B. F. Ruether, general manager of the New York Belting and Packing Company, has announced the appointment of Crerar, Adams & Co., 3550-3558 South Morgan street, Chicago, Ill., as distributors of the complete line of New York Belting and Packing Company mechanical rubber goods in the Chicago territory.

Through the facilities of Crerar, Adams & Co., users of high grade mechanical rubber goods are assured complete stocks and efficient service. New York Belting and Packing products are sold through distributors only.

The Schlicter Jute Cordage Company, Philadelphia, has appointed W. A. Iden, of the Cordage and Twine Company, 11 North Green street, as distributors of twine made by the Schlicter company in this area.

Abitibi Power & Paper Co. Reorganization

Settlement Recommended to Ontario Government by Ontario Hydro Commission—Timber Limits Granted by Government Revised — Fort William Newsprint Mill May Resume Shortly — Howard Smith Expansion Plans.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., February 8, 1937—The Ontario Hydro Commission will recommend to the Ontario Government a settlement which it is willing to accept in connection with the re-organization of the Abitibi Power and Paper Company, Toronto, which in 1932 went into receivership. Since then the Ontario Government has taken a prominent part in re-organization efforts because of its interest in the extensive timber limits. The Government has been careful in this work to see that sufficient capital is on hand to assure operation of the concern for some time. The Abitibi Company operate plants at Iroquois Falls, Smooth Rock Falls, Espanola, Sturgeon Falls, Sault Ste. Marie, Port Arthur and Fort William.

It is understood that the Government has somewhat revised the timber limits granted to the Abitibi company. These have been re-allocated according to Government policy, awarding them with due regard to watersheds. The Abitibi plants under the direction of the receiver have all been operating with the exception of those at Espanola, Sturgeon Falls and Fort William and it is hoped reorganization will bring about the resumption of activities at these points at an early date.

Joseph E. Crawford, M.L.A. for Fort William, Ont., who recently had a conference with the Hon. Peter Heenan, Minister of Lands and Forests for the province, reports that re-organization of the Abitibi Power and Paper Company is proceeding with so much satisfaction that the Fort William mill of the company should be producing newsprint within the next three months. The possibility of an early start, was seen recently when twelve car loads of pulp wood were delivered at the mill. It is reported that the machinery is being tuned preparatory to the commencement of work.

Howard Smith Expansion Plans

An extensive expansion program involving an expenditure of $400,000 is being carried out by the Howard Smith Paper Mills plant near Cornwall, Ont. Large additions will be built to the sulphite and soda pulp mills, which will increase production from 147 tons to 210 tons per day. It is expected that the work will be finished by the middle of June. Excavation has started on the addition to the sulphite mill, which will be 43 x 33 and 100 feet high. The addition to the soda pulp plant will be 30 x 145 and 40 feet high. Production in the sulphite mill will be increased from 77 tons per day to 110 tons by the installation of new digesters, acid recovery tanks, etc. The capacity of the soda pulp mill will be raised from 70 to 100 tons per day. With the new installations, the pulp mills will eventually use about 400 cords of poplar and spruce pulpwood per day, or approximately 8,400 cars a year. The spruce is cut in Ontario, the Abitibi limits, and below Quebec, while the poplar comes from the Ottawa Valley in the Lower St. Lawrence.

Will Increase Newsprint Output

"Newsprint production in Ontario will be increased by at least 100,000 tons during the coming year," was the statement made by the Hon. Peter Heenan, Minister of Lands and Forests for the province. He said that Ontario is now exporting annually between 375,000 and 400,000 cords of pulpwood to the United States. Mr. Heenan defended some criticism which has been levelled at the export policy of the present administration. He said that forestry experts had investigated, and had reported Ontario was exporting only two-thirds of the new growth. Newsprint production in the province has been increased 250,000 tons annually the last two years.

The Government had reduced stumpage dues by 50 per cent, but revenues had increased $1,250,000 the first year, $2,000,000 the second year, and would increase $3,000,000 this year. He said that forestry needed men of special training to cope with modern conditions, and in the future the timber industry and all its related interests must be operated scientifically.

Pulp Mill Waste

Pulp and paper mills of Canada waste $5,000,000 a year through the sulphite process, D. E. Read, manager of the International Fiber Board Company told the Ottawa Valley branch of the Canadian Pulp and Paper Association at a recent meeting held in Ottawa. Over 600,000 tons, he estimated, went down the drain. Mr. Read also related some of the work which was being done in Sweden in forestry. Sweden was supervising all branches of forestry and had greatly reduced the fire hazard and encouraged new growth.

In the discussion which followed Mr. Read's paper a number of the members said that the opportunity for saving in the ordinary paper mill was almost unlimited. One member told of a mill which was wasting $40,000 a year which could easily have been saved with the addition of certain machinery.

News of the Industry

It is understood that representatives of the Powell River Company, Powell River, B. C., which is the largest newsprint producing organization on the Pacific Coast, have gone to Texas where they will negotiate with publishers of the Southwestern States for a new price set-up. William Barclay, manager of the newly organized Powell River Sales Company, heads the delegation, which will endeavour to make a deal for increasing prices to take effect during the latter half of 1937 or early in 1938. The Powell River Company sells a large part of its product to daily newspaper publishers in California.

A. L. Johnson, president of the General Timber Company, who hold extensive pulpwood limits in the Thunder Bay District, recently announced a contract for the sale of approximately $5,000,000 worth of pulpwood. The deal is with the Marathon Paper Mills Company, Rothschild, Wis., which manufacture cartons and other specialty papers. It is stated by Mr. Johnson that the United States concern may open processing plants in Ontario at a cost of $4,000,000. He states that the Wisconsin company and allied interests are also looking for suitable sites on which to establish Canadian units, and that one site has already been decided upon.

Boston Paper Business Displays Strong Trend

Good Volume of Various Grades of Paper Moving Into Consumption — Cover Papers Begin to Advance—Wrapping Paper Continues Very Firm—Difficulty Experienced in Obtaining Spot Shipments from the Paper Mills.

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., February 8, 1937.—The wholesale paper market in Boston and vicinity was strong with a good volume moving. In the fine paper division, cover papers have begun to advance. Wrapping paper was very firm, with all grades showing an advancing tendency. It is exceedingly difficult to get spot shipments from the mills.

Paper stock generally was very strong, with a few exceptions, and it was said to be hard to secure at least some materials at prices satisfactory to all concerned. Under old papers, mixed papers moved in fair volume. There were plenty of supplies of mixed papers, but prices were strong. Old papers in general held their own, especially No. 1 kraft, which brought 1.40 @ 1.45 f.o.b., Boston, with quotations unchanged. Kraft paper was very much sought after.

Bagging continued firm. It is understood from reliable information that foreign manila rope had advanced in price, but no figures were given, although there were reports that higher prices than 3.60 f.o.b., Boston, had been paid. Some dealers, at least, asked 2.50 for both gunny and scrap burlap, but it was stated that no sales were made at this figure, because it was regarded as too high.

New domestic rags advanced in nearly all grades. Under shirt coverings, new light prints rose to .04 @ .04¼ from .03⅝ @ .03⅞, new white No. 1 to .08¾ @ .09 from .08¼ @ .08½, new white No. 2 to .06 @ .06½ from .05½ @ .06, Silesias No. 1 to .07¼ @ .07½ from .06¼ @ .07, new black silesias to .04¼ @.04½ from .04 @ .04¼, soft unbleached to .09¼ @ .09½ from .08¾ @ .09, blue cheviot to .07½ @ .07¾ from .07 @ .07¼, fancy to .03¾ @ .04 from .03¼ @ .03½, washable to .03 @ .03¼ from .02¼ @ .03, all f.o.b. Boston. Under cottons according to grades, blue overalls advanced to .07¼ @ .07½ from .07 @ .07¼, new black, soft, advanced to .04¼ @ .04½ from .04 @ .04¼, corduroy to .03¼ @ .03½ from .03 @ .03¼, and B. V. D. cuttings to .08¾ @ .09 from .08 @ .08¼, all f.o.b. Boston. In old domestic rags, No. 1 roofing stock has declined to 1.70 @ 1.80 from 1.80 @ 1.90 and No. 2 roofing stock to 1.60 @ 1.70 from 1.70 @ 1.75 f.o.b., Boston, on account of these conditions.

Many packers have been holding roofing stock in order to secure higher prices, but have come to the conclusion that the top has been reached. So first one and then another reduced their prices. Furthermore, mills are so congested with material that they likewise reduced the price they would pay. Packers are asking prices for foreign rags that mills are loath to pay. It was expected that values would recede generally, but such a development has not taken place, although dark cottons have been bought at 2.25 @ 2.30, a lower figure on the high side than previously quoted, or 2.25 @ 2.35. In some quarters, buyers will pay only 2.10, f.o.b., Boston. Japanese dark cottons have sold at 1.90 @ 2.00, f.o.b., Boston. New silesias rose to 7.00 @ 7.25 from 6.00 @ 6.50 f.o.b., Boston.

The box board market was very firm, although new orders have lessened considerably in volume. Shoe box manufacturers were very busy, so that the demand for boards for their purposes was brisk.

New England Paper Merchants Meet

Paper merchants of Boston and vicinity gathered Wednesday evening at the Hotel Touraine for the annual dinner and election of the New England Paper Merchants Association. Robert M. Stone, president of Stone & Forsyth Company, was in the chair. The following officers for the coming year were elected: President, Frank H. Winter, Carter Rice & Co., Corp.; Vice-President, Wrapping Division, John R. Halkyard, Providence Paper Company, Providence, R. I.; Vice-President, Fine Division, J. Frank Halloran, Century Paper Company; Secretary and Assistant Treasurer, John C. Hurd; Treasurer, Frank B. Cummins. Board of Directors, four members, W. E. Porter, Jr., Cook Vivian Company; Arthur C. Biza, Henry Lindenmeyr & Sons, Hartford, Conn.; Harry J. Dowd, H. J. Dowd Paper Company, and John E. Roach, Fort Hill Paper Company.

Trade Conditions Discussed

Speakers of the evening were Chester M. Spaulding, assistant secretary of the National Paper Trade Association, New York, and John R. Shultz, secretary of the Boston Typothetae, Inc. The former discussed prevailing trade conditions in the wrapping paper field and the latter presented the advantages of trade association work and the benefits of friendly cooperation between associations in related lines of business.

The secretary-treasurer, John C. Hurd, reported one new member house, the Kendall Paper Company, Cambridge, Mass., and gave a satisfactory financial report for the year.

News of the Industry

At a salesmen's meeting of the Andrews Paper Company, held Saturday at the office of the company, Donald L. Gibbs was awarded the first prize of a gold watch and W. Dillaway, the second prize in the Howard Bond Contest, of the Howard Paper Company, Urbana, Ohio. The presentation was made by Frank Merrill, an executive of the company, with Fred Herbolzheimer, head of the fine paper department, presiding.

Henry W. Ford, manager of the fine paper specialty department of the Andrews Paper Company, has returned from a highly successful trip to New York and Philadelphia. He found business generally in diploma lines greatly improved. The engrossers are all exceedingly busy.

Knight, Allen & Clark, Inc., are adding another trunk line to their telephone system, making four trunk lines in all. The new system will improve the telephone service 100 per cent and do away considerably with the use of the switchboard.

Members of the sales force of Knight, Allen & Clark, Inc., are to gather at a dinner at the Hotel Manger February 18 for a talk with representatives of the Eastern Manufacturing Company, which has plants at Brewer and Lincoln, Me. Papers made by that company will be discussed.

George Green, of Green Bros., Inc., Providence, well known among box board and paper dealers here, has returned from a sail to Norfolk, Va.

Activities of the Philadelphia Paper Industry

Engraved Resolution to Be Presented by Paper Trade Association to Retiring President N. A. Considine in Appreciation of His Services for Past Two Years — Ceremony to Take Place at Meeting of Board of Governors.

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., February 8, 1937.—A special meeting of the Board of Governors of the Paper Trade Association of Philadelphia will be held on Friday of this week at which time an engraved resolution will be presented to the retiring president, Norbert A. Considine, in appreciation of his services for the past two years.

Huyck Motion Picture Film Shown

F. C. Huyck & Sons presented for the first time in the Delaware Valley area last week, a general showing of its ne wsound motion picture film, "Two Related Industries." The showing took place following a dinner in the North Gardens of the Bellevue-Stratford Hotel in Philadelphia. Sixty-seven executives and superintendents of paper mills throughout Eastern Pennsylvania, New Jersey, Delaware and Maryland attended. The guest list follows:

A. N. Aron, Mazer Paper Mills, Lansdowne, Pa.; E. F. Anderson, Scott Paper Company, Chester Pa.; J. R. Atwater, Dill & Collins, Inc., Philadelphia; Arnold Barea, Paterson Parchment Paper Company, Bristol, Pa.; Warren L. Bender, Downingtown Paper Company, Downingtown, Pa.; Leroy Benge, Marshall Bros., Yorklyn, Del.; M. G. Benson, Dill & Collins, Inc., Philadelphia; L. W. Bicking, S. A. Bicking Co., Downingtown, Pa.; Lawrence Bidwell, Riegel Paper Corporation, Philadelphia; Henry Boan, Paterson Parchment Paper Company, Bristol, Pa.; P. D. Bradley, Elk Paper Company, Childs, Md.; F. Brainerd, Scott Paper Company, Chester, Pa.; A. J. Brookover, Jr., Downingtown, Paper Company, Downingtown, Pa.; John H. Brougham, Penn Fibreboard Corporation, York, Pa.; W. E. Brow and T. F. Castor, Container Corporation of America, Philadelphia; C. M. Connor, Valley Forge Laboratory, West Conshohocken, Pa.; J. Cormie, Agasote Millboard Company, Trenton, N. J.; J. M. Chestnut, McDowell Paper Mills, Philadelphia; S. B. De Farges, Jessup & Moore Paper Company, Philadelphia; James Fish, Paterson Parchment Paper Company, Bristol, Pa.; Jesse F. Good, Hinde & Dauch Paper Company, Gloucester, N. J.; Arthur Gould, Paterson Parchment Paper Company, Bristol, Pa.; John W. Gray, Downingtown Paper Company, Downingtown, Pa.; P. Gross, Mazer Paper Mills, Lansdowne, Pa.; J. F. Halliday, Continental Corporation of America, Philadelphia; J. H. Harrison, Agasote Millboard Company, Trenton, N. J.; C. M. Howell, Scott Paper Company, Chester, Pa.; Leslie Justice, Valley Forge Laboratory, West Conshohocken, Pa.; John Kagerhuber, Downingtown Paper Company, Downingtown, Pa.; H. M. Kieckhefer, Kieckhefer Continental Corporation, Delair, N. J.; William C. Law, S. A. Bicking Paper Company, Downingtown, Pa.; John J. Lobb and George Lockbaun, Scott Paper Company, Chester, Pa.; Cecil Lynch, Dill & Collins, Inc., Philadelphia; Wm. Marrs, National Vulcanite Fibre Company, Newark, Del.; W. R. Maull, Dill & Collins, Inc., Philadelphia; M. Craig Maxwell and Frank MacAndrews, McDowell Paper Mills, Philadelphia; Frank Meunier and L. J. Meunier, Kieckhefer Continental Corporation, Delair, N. J.; J. K. Miskimmin, Continental-Diamond Fibre Company, Bridgeport, Pa.; J. M. Moore, Paterson Parchment Paper Company, Bristol, Pa.; M. Newman, I. Newman and L. Newman, Phil-Fibre Boxboard Company, Philadelphia; E. H. Niederauer, Dill & Collins, Inc., Philadelphia; J. W. Outerson, Paterson Parchment Paper Company, Philadelphia; T. A. Pierson, Jr., Agasote Millboard Company, Trenton, N. J.; H. W. Piquet, MacAndrews & Forbes, Camden, N. J.; Walter P. Quinn and S. D. Reynolds, Continental Corporation of America, Philadelphia; A Schnabel, Mazer Paper Mills, Lansdowne, Pa.; H. C. Schwalbe and C. A. Shubert, Dill & Collins, Inc., Philadelphia; W. T. Simms, Johns-Manville Corp. Manville, Pa.; L. R. Soliday, Phil-Fibre Boxboard Company, Philadelphia; L. J. Spangler, Johns-Manville Corp., Manville, N. J.; Oscar Stamets, Riegel Paper Corp., Riegelsville, N. J.; R. E. Stearns and B. M. Thomas, Continental Corporation of America, Philadelphia; Harold L. Waltman and W. T. Watson, Scott Paper Company, Chester, Pa.; Walter Wendt, Hinde & Dauch Paper Company, Gloucester, N. J.; A. W. Wickham, MacAndrews & Forbes, Camden, N. J.; H. F. Winchell, Scott Paper Company, Chester, Pa.; Dr. K. R. Younger, Johns-Manville Corp., Manville, N. J.; H. M. Ashby, Alan R. Boyd, J. L. Braman, William Greeley, George McLeod, Dr. E. A. Rees and John D. Skeer, F. C. Huyck & Sons, Albany, N. Y.

New Warehouse for D. M. Bare

I. L. Gartland, general sales manager of the D. M. Bare Paper Company, announces that construction of their new warehouse at Roaring Spring, Pa., is well under way. Its location on a railroad siding with complete facilities will enable them to load simultaneously freight cars and five high-speed trucks for overnight delivery from Roaring Spring. The new warehouse will afford additional capacity for the storage of 1,000 tons of paper.

New Alemite Industrial Catalog Out

The Alemite Division of Stewart-Warner Corporation, Chicago, has just published its 1937 industrial catalog—"Alemite Controlled Lubrication." The introduction calls it the "Show Book of the Alemite Systems," and in 56 pages are presented the entire range of Alemite's industrial equipment—hand guns, power-operated units, fittings, hose, valves, meters, etc., including a complete section of hand gun repair parts, simplifying the ordering of parts for standard Alemite equipment.

The book is printed in two colors, and is profusely illustrated with photographs, drawings and diagrams. An interesting feature is the great number of photographs of Alemite equipment in actual use in many different types of industries—photographs taken on an extensive trip sponsored last year by Alemite to secure a collection of such photographs with data on how modern systematic lubrication is cutting maintenance costs in industry.

For a free copy of "Alemite Controlled Lubrication," send your request to Stewart-Warner Corporation, 1826 Diversey Parkway, Chicago, Ill.

General Dyestuff's New Home

General Dyestuff Corporation is now installed in its magnificent new business home at 435 Hudson street, New York. The building, representative of the latest and best in modern architecture, is designed to be as satisfying in appearance, both in its internal and external aspects, as it is efficient in the functional character of its plan.

Here, General Dyestuff Corporation has combined its offices, laboratories, warehouse and shipping rooms and equipped them with every modern facility for service. The company is "at home" in these new headquarters, from which a complete line of dyestuffs for every purpose is offered, backed by a comprehensive technical service for their application.

By means of structural glass brick and high, wide windows, the reception room, executive offices and directors' room are well lighted, cheerful in aspect and atmosphere. The office departments are also arranged and lighted in the same efficient manner. The floors are of rubber linoleum in various colors and designs adapted to a modern treatment. These, with the acoustical ceilings, control and absorb sound and lend an air of quiet efficiency to the offices. The furniture is of the most modern character, constructed and arranged according to the best principles of modern office engineering.

From the executive office on the ninth floor one has an unobstructed view of the offices which adjoin the laboratory. Every part of the large laboratory floor, covering an area of 25,000 square feet, is given the benefit of efficient lighting, so important in the proper handling of colors, due to the general use of structural glass bricks. Here testing and matching are conducted under ideal conditions. This laboratory is at the service of consumers of dyestuffs for paper, wool, cotton, silk, rayon and various mixed fibers. Stainless steel equipment is used to a large extent.

In the six floors devoted to warehouse purposes, ample space is provided for meeting increased delivery demands. Containers are packed and stored according to methods that facilitate their handling and give full protection to the products within. New sets of scales have been installed at convenient points in the building. The company maintains a fleet of trucks operated by drivers and helpers trained in the proper handling of dyestuffs.

The new building is entirely modern throughout, and holds the distinction of being the largest structure of its type to be erected in New York during the last six or eight years. From these new headquarters the staff will henceforth apply their background of experience and skill to the scientific servicing of General Dyestuff products.

Flood Prevention Steps Taken

[FROM OUR REGULAR CORRESPONDENT]

DAYTON, Ohio, February 8, 1937.—That no time was lost by Ohio's leaders in taking flood-prevention steps, was evidenced Wednesday last when Alexander Thomson, chairman of the board of the Champion Paper and Fibre Company, Hamilton, called a meeting at Columbus, as president of the Ohio Chamber of Commerce. Dayton, Middletown, Hamilton, Cincinnati and other places were represented. Business organizations and public officials discussed the problem fully and action was taken approving the Bulkley-Secrist bill as "a measure best calculated to produce the immediate and desired results."

Preesident Thomson, who presided at the meeting, said, in part: "We have had a disastrous flood. The weather authorities tell us we could have had a hundred-foot stage of the Ohio River at Cincinnati. We want something done and we must not let other subjects prevent us from securing prompt action."

Most of the paper mills in the valley are back on normal operation schedules after interruptions due to lack of power.

The Gardner-Richardson Company, Middletown, which furnished current to outsiders and helped Middletown do business in restricted hours last week, turned over nearly $800 it received from power sources, to the Red Cross.

In Cincinnati business is just getting back to normal, with power facilities still restricted. Most paper houses which could do so, shifted their stocks to higher floors and escaped water damage; others were not so fortunate.

Big Prizes for Arc Welding Papers

One of the richest awards ever established for competition in the field of mechanical science has just been announced by The James F. Lincoln Arc Welding Foundation.

To stimulate intensive study of arc welding, $200,000 will be distributed by the Foundation among winners of 446 separate prizes for papers dealing with this subject as a primary process of manufacture, fabrication or construction.

The principal prize winner will receive not less than $13,700. Other prizes range from $7,500 to $100—the latter sum to be awarded each of 178 contestants who receive no other prize, but whose papers are adjudged worthy of honorable mention.

When accepted by the Jury of Awards as properly classified, each paper will be in competition, in its particular sub-classification, for five initial prizes established for that group. These are worth, respectively, $700, $500, $300, $200 and $150.

From among these sub-classification winners, four papers will be selected in each major industry to receive additional prizes of $3,000, $2,000, $1,000 and $800. Thus these 44 semi-finalists will be awarded a total of $74,800.

In addition, the semi-final winners in the various divisions will be considered as possible recipients of the four Main Prizes. These range from $10,000 to $3,500, with the winner of the Grand Prize receiving not less then $13,700 for his paper.

To participate in this contest, it is necessary that submitted papers describe either the redesign of an existing machine, structure, building, etc., so that arc welding may be applied to its manufacture; or that they present a design (either in whole or in part) of a machine, structure, building, etc., not previously made — the description to show how a useful result, which was impractical with other methods of construction or could better be done by arc welding, is obtained.

Contestants must have papers in duplicate on file with the Secretary of the Foundation, at Cleveland, Ohio, not later than June 1, 1938. Prospective entrants should communicate promptly with Foundation Secretary A. F. Davis, P. O. Box 5728, Cleveland; for complete details of the rules and conditions covering awards.

Pacific TAPPI To Meet

The next meeting of the Pacific Section of the Technical Association of the Pulp and Paper Industry will be held at the Olympian Hotel, Olympia, Wash., on March 2, 1937. It will meet again at Port Angeles, Wash., on April 6, 1937.

Irwin Paper Co. Starts Fiftieth Year

QUINCY, Ill., February 9, 1937—January, 1937, started the fiftieth anniversary year of the Irwin Paper company, which has the distinction among Quincy business firms of being one that is still under the direction of its founder. The company was established here in 1887 by Leaton Irwin, and through the half century he has continually been its head. Mr. Irwin is now chairman of the board of the company, which has expanded to include besides the parent concern here, the Peoria Paper House, Inc., and the Decatur Paper House, Inc. Though he is at his winter home in Tampa, Fla., Mr. Irwin supervises his business interests in Illinois almost the same as when he is in Quincy. He has been succeeded as president of the Irwin Paper company by his son, Mac Irwin, who also is president of the Quincy Compressor company.

A biographical sketch of Mr. Irwin practically tells the history of his paper company. Mr. Irwin was brought up on a farm in Missouri, and left home at fourteen to work his way through high school and college. Later he received an appointment to West Point at the same time one was awarded General Pershing. Stopping in Quincy to visit, Mr. Irwin decided to remain here instead of entering the military academy. He became a teacher of mathematics in Chaddock college and also taught a private class in shorthand. His business career began when he took a position as the first commercial stenographer in Quincy with Pope-Lockwood and Company. He soon saw the opportunities offered a young man in business, and decided to open a paper house. After failing to open an account with one bank, Mr. Irwin appealed to H. F. J. Ricker, Sr., to whom he gives all credit for his early success. When a young man demonstrated his fitness Mr. Ricker went all the way with him, and Mr. Irwin, though only twenty-four years old, was furnished all the money he could use without security.

Farewell Banquet to W. B. Vanarsdel

BERLIN, N. H., February 8, 1937—The members of the Brown Company Research Department gave a farewell banquet February 3 for W. B. Vanarsdel, who is leaving to take a position as chemical engineer with the United States Department of Agriculture. Representatives of the Research Department and of the Berlin organizations paid tribute to the value of his leadership in many civic activities. He was presented with a billfold containing a sum of money as a farewell gift.

Mr. Vanarsdel came to the Brown Company in August, 1914, soon after the Research Department was organized. During the War he served as assistant director of the Research Department and later as mathematician, physicist, and chemical engineer.

In his new position, Mr. Vanarsdel will be located at the U. S. Agricultural Experimental Station at the University of Illinois, Urbana, Ill., where he will be in charge of investigations and development work on the industrial utilization of farm products, particularly the cultivation and use of soy beans. He starts his new work February 15.

E. G. Johnson Resumes Old Duties

Homestead Valve Manufacturing Company announces the return of Elliott G. Johnson to take over his old duties as advertising manager, after a four year leave of absence, during which, he was serving the Government as Ordnance Engineer with the Navy.

A background of Mechanical Engineering received at Carnegie Institute of Technology, and early training at Westinghouse Electric and Manufacturing Company, prepared Mr. Johnson for his work in the industrial advertising field. He previously served Homestead Valve Manufacturing Company as advertising manager for seven and one half years, and is a past president of the Industrial Advertising Council of Pittsburgh.

Imitation Hand Made Paper

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., February 9, 1937.—The McCorkindale Company has bought a half interest in certain patents for the manufacture of an imitation hand made paper with four side deckle edge from the American Writing Paper Company, Inc. The process is covered by Canadian and British as well as American patents. It is understood that the American Writing Paper Company has spent some $50,000 in experimental and development work.

Papers filed in the United States Federal Court in Boston disclosed that the American Writing Paper Company will receive certain royalties, plus other compensation based on future sales of the McCorkindale Company. The American Writing Paper Company also turns over certain machinery, including finishing and washing equipment used in the process and agrees to furnish the McCorkindale Company certain rag half stock as needed. The processes were invented by William McCorkindale.

Frank Gross Buys Norman Mill

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., February 9, 1937.—Announcement was made last week that the sale of the Norman Division of the American Writing Paper Company, Inc., held some days ago was to Frank Gross of Boston who paid $3500 for the property. Current opinion among manufacturers seems to indicate that he got a bargain. There will be a hearing before the Federal Court in Boston on the 15th to take action on the sale. There were eighteen bids.

At the same time the Federal Court will be asked to approve of the sale of the idle mill in Unionville, Conn., to the Connecticut Light and Power Company for $5,026.

The Norman mill was built in 1891 and sold with the Wauregan Paper Company mill by James H. Newton when the American Writing Paper Company was formed.

Champion Aids Flood Refugees

DAYTON, Ohio, February 8, 1937—Four tank cars carrying 40,000 gallons of water were filled at the plant of the Champion Paper and Fibre Company, at Hamilton last week and sent to Cincinnati by rail. The water was distributed at Cheviot where there were several thousand flood refugees.

The tanks, which are the property of the paper company, were cleaned and sterilized by the firm's chemical department, and then filled with water by mill employees. The cost of transportation was borne by the company.

Paper Merchants Flood Losses Light

CINCINNATI, Ohio, February 8, 1937.—Due to the flood here, things have been very seriously disrupted, but the Pittsburgh houses were not damaged by the flood this time, from an inventory standpoint.

None of the fine paper houses in Cincinnati suffered any loss excepting Sabin Robbins Paper Company, and the only coarse paper houses taking an inventory loss are Herrlinger Paper Company, Anchor Paper Company, Paragon Paper Company, Seinsheimer Paper Company and Central States Paper Company.

New L-R Flexible Couplings

Lovejoy Tool Works, 4946 West Lake street, Chicago, announce an L-R coupling of new design—the Type WF, which is made with one of the bodies in the form of a flange which bolts onto the flywheel or a clutch or brake drum of a Diesel, gas or steam engine. The flange-body design reduces the overall length of this coupling by one-third. A recently installed WFR-800 coupling, capable of carrying a load of 324,000 inch pounds, extends less than 6 inches beyond the rim of the flywheel. It is apparent that this saving of space at an important point,

allowing many more inches for frame and other parts, must add considerable to the efficiency and life of both drive and driven unit. The L-R Type WF Flexible Coupling will be made in sizes from 3 inches to 14 inches bores suitable for 2500 hp. at 100 r.p.m.

As on the well known L-R Type W, free floating load cushions are held in place by a quickly removable outside retaining spring. This permits larger hubs and greater load carrying surfaces with consequently increased carrying capacity. The load cushions are always in plain sight and can be removed and replaced in a few minutes without tearing down the coupling. This principle has been thoroughly tested in seven years of service.

Three types of resilient cushioning material are available for each of these couplings:

1. Metalflex—a high grade, long wearing brake lining material, used for heavy shock loads as on excavating machinery, steel mill equipment and other machines exposed to extreme weather conditions.

2. Leather Load Cushions—of best oak tanned belting leather, for use on sustained loads and greater misalignment.

3. Multiflex Cushions—a rubber duck fabric, vulcanized under high pressure, for use on fluctuating loads and where high resilience is required.

By application of suitable materials and design, capacities may be increased without change in overall dimensions.

For further information, details and literature on the new coupling, address this paper or the manufacturer.

New Cochrane Publications

New Cochrane publications 2094 and 2540 have just been published. Publication 2094 describes the Cochrane Mechanical Flow Meter in detail, including its features of high operating power, means of checking the accuracy, uniformly-graduated charts, rugged construction and adaptability to varied conditions.

Publication 2540 is devoted to a discussion of the prevention of corrosion by complete removal of oxygen and dissolved gases from the feed water in modern steam plants.

The trend toward higher operating pressures and temperatures, which has been accompanied by the use of steel tubes in boiler and economizer construction, makes it imperative to utilize feed water of zero oxygen content, if positive insurance is to be had against corrosion. The publication just named illustrates how the Cochrane Deaerator, which delivers water of zero oxygen content, effectively safeguards the operation of modern boiler systems. Copies may be obtained from the Cochrane Corporation, 17th street and Allegheny avenue, Philadelphia.

Waxide Installs York Air-Conditioning

With the installation of a 20 h.p. "Freon-12" air conditioning system, the Waxide Paper Company is saving several thousand dollars a year in losses on sticky paper in hot weather. The Waxide Paper Company is a large manufacturer of waxed paper, with plants in Kansas City and St. Louis. Prior to the installation of air conditioning, the company experienced a considerable loss, in hot weather, due to paper sticking on rolls during manufacture.

The air conditioned room in Kansas City is approximately 65 feet wide by 87 feet long, by 10 feet 6 inches high, inside dimensions. This room is located on the first floor of a two story-and-basement building. Ceiling of the room is insulated with an inch of Temlok, while one side and one end were built of six inch tile, backed up with two inches of cork. The other side and end are not insulated.

Air conditioning equipment includes a 20 h.p. "Freon-12" condensing unit operating with a cooling tower, and three C-1508 coils built up in a sheet metal housing provided with standard air filters.

A 10,000 C.F.M. Sirocco fan circulates the air, and was arranged for two speed operation so the blower can be operated at low speed in winter for ventilating purposes. A single air distributing duct was installed along the ceiling, running the long way of the room.

The system is designed to maintain an inside dry bulb temperature of 75 deg. F. with not over 55 per cent relative humidity, when outside conditions are 95 deg. F. dry bulb and 67 deg. F. wet bulb.

New Standard Conveyor Bulletin

Standard Conveyor Company, North St. Paul, Minn., has issued a new bulletin describing their Standard piler conveyors and combination piler conveyors. This equipment employs an endless carrying apron supported on an adjustable boom to enable piling materials to heights of thirty feet or greater. The equipment, which is portable, enables easier handling of materials in warehouses, mills, industrial plants, packing plants, wholesale houses, marine and river terminals, or wherever materials must be stored or shipped. The piler conveyors are adaptable to sacked, barreled, boxed, baled or flat materials. A copy of the bulletin, entitled "The Key to Greater Profits —the Standard Piler," may be obtained free of charge on request to the factory.

Bausch & Lomb Open New Laboratory

At a cost of approximately $40,000 and a 50 per cent increase in its staff of graduate chemical engineers and metallurgists, Bausch & Lomb has opened a new laboratory for applied research.

Guided by Frank P. Kolb, chief chemist, and Theodore J. Zak, assistant chemist, company officials saw the conversion of nearly 9,000 square feet of space on the fifth floors of two buildings facing the Genesee River into a series of laboratory units devoted to research in the fields of metallurgy, experimental electro-plating, spectroscopy, photomicrography, and physical testing. A well-stocked library and a consulting room add to the facilities of the research staff.

Obituary

Walter H. Yarwood

SYRACUSE, N. Y., February 8, 1937.—Walter H. Yarwood, long a prominent resident of Fulton and Syracuse, died recently in his chair in the office of the Three Rivers Paper company at Phoenix. Mr. Yarwood had been owners and president of the company for several years.

He was born January 12, 1875, in Oswego, son of Matthew and Elizabeth Chauncey Yarwood. For twenty years he was connected with the Saeger Brothers Knitting company in Syracuse.

About twenty years ago he joined his uncle, the late George Chauncey, in the Three Rivers Paper Mill. Mr. Yarwood became vice president when he joined his uncle.

Shortly after the death of Mr. Chauncey, Mr. Yarwood became president and owner of the mill. Mr. Yarwood was an active church member and contributed generously to the church, welfare movements and drives for commendable purposes. His last act in that manner was dispatching a check to the Red Cross flood relief fund Friday morning, a few hours before his death.

He was a member of the Episcopal Church and for many years was an usher in St. Paul's Church in Syracuse. He was a member of the Citizens Club and the Masonic Club in Syracuse. In Fulton, his only fraternal connection was the Fulton Club, formerly the Citizens Club.

Mr. Yarwood married Florence L. Hixson August 28, 1919. Mrs. Yarwood survives with a stepson, Dr. George D. Hixson of Lockport; and two sisters, Mrs. Ella Heddon of Skaneateles and Syracuse and Mrs. Matie Cunningham of Rochester.

Richard B. Brown

PLYMOUTH, Mass., February 8, 1937.—Richard Baxter Brown, aged 63, associated with the Plymouth Cordage Company for 45 years, died Tuesday at his residence, 7 Winslow street, after an illness of less than a week.

Mr. Brown was born in Duxbury, Mass., July 6, 1873, a son of Oliver Brown and Mary C. (Bates) Brown. He attended Plymouth High School and the Massachusetts Institute of Technology, being in the Class of '95, the same as Gerard Swope and Alfred P. Sloan.

He was leader of the Plymouth Men's Glee Club, Christ Episcopal Church choir and the Plymouth Cordage and Pilgrim bands. For a while, he was secretary of the musician's union. He was known and highly regarded by persons in every walk of life in the town.

Besides his widow, Mrs. Margaret Errington Brown, he leaves ten children, five brothers, two sisters and thirteen grandchildren.

The funeral was held Thursday at the Episcopal Church, with officials of the Plymouth Cordage Company, leaders in town affairs and representatives of local musical organizations present. Burial was in Vine Hill Cemetery.

Edwin H. Newton

KANSAS CITY, Mo., February 8, 1937.—Edwin H. Newton, president of the National Paper Box Company at Twentieth street and Tracy avenue, died recently at Lakeside Hospital. He was 61 years old. His death followed a brief illness from influenza.

Mr. Newton was born in Westboro, Mass., and had been in the box manufacturing business virtually all of his adult life. He came here twenty years ago to become associated with the Kansas City concern.

Mr. Newton lived at 4809 Jarboe street. He was a member of the Rotary Club, the Chamber of Commerce and the Kansas City Club.

He was also an elder in the Central Presbyterian Church and a member of the Masonic fraternity. In previous years, Mr. Newton also had been active in Boy Scout work.

Surviving are his widow, Mrs. Lillian C. Newton, and a sister, Miss Mattie E. Newton of Westboro.

Hamlin M'Cormick

An Associated Press dispatch from Portland, Ore., states that Hamlin F. McCormick, one of the leading figures of the Pacific Coast pulp and paper, lumber and steamship industries, died February 6 of influenza. His age was 62.

Mr. McCormick was president of the St. Helens Wood Products Company and chairman of the board of directors of the St. Helens Pulp and Paper Company.

He and his brother, Charles R., organized the Charles R. McCormick Lumber Company, the third largest in the Northwest. Out of it was created the McCormick Steamship Company, operating forty vessels in intercoastal, coastwise and South American trade.

Mr. McCormick and his brother came to the Pacific Coast in 1900 from Saginaw, Mich., where their father had been a prominent lumberman.

His widow and brother survive.

Edson L. Lyman

Edson L. Lyman of Holyoke, Mass., aged 79, died Monday, January 25, after a short illness, of pneumonia.

Mr. Lyman was born in South Hadley, Mass., and came to Holyoke at an early age, to spend the balance of his life there. He married Margaret Ramage, daughter of Adam Ramage, a pioneer in paper manufacturing and, around 1870, co-editor of the Paper Trade Journal.

Mr. Lyman left three sons, R. W. Lyman, with the Livingston Manufacture Company, a textile organization in Holyoke; J. R. Lyman, superintendent of the Newton Paper Company, Holyoke; and E. R. Lyman, of the Missisquoi Corporation.

Japan Increases Paper Production

Production of foreign style or machine made paper in Japan by members of the Japan Paper Manufacturers' Association reached a total of 228,640 short tons during the third quarter of last year, an increase of 4 per cent over the corresponding year of 1935. Sales during this period amounted to 225,820 tons an increase of 11 per cent over the corresponding period of 1935.

During the first 9 months of 1936, the output of foreign style or machine made paper totaled 672,724 tons, an increase of nearly 5 per cent over the same period of 1935. Sales during this period showed an increase of nearly 9 per cent.

Compared with developments in the pulp industry, conditions in the Japanese paper industry were relatively uneventful. A few plant additions were announced, but the most important announcement involved the establishment of Japanese paper mills in North China.

Howard A. Casey Resigns

Howard A. Casey, long and favorably known to many paper merchants, has resigned his selling connection with the Collins Manufacturing Company, of North Wilbraham, Mass., effective March 1. Mr. Casey has no announcement to make as to his future plans and can be reached at his home at 136 Yale street, Springfield, Mass.

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Kansas City, Mo.—The Crook Paper Box Company, 906 East Nineteenth street, manufacturer of paper boxes and containers, folding boxes, etc., has arranged for lease, with operation to purchase, of new industrial building on Tenth avenue, near Burlington avenue, North Kansas City, to be constructed by the North Kansas City Development Company, Railway Exchange Building, Kansas City. New structure will be one-story and basement, 200 x 275 feet. General contract has been awarded to the Morris Hoffman Construction Company, Victor Building, city, and superstructure will be placed under way at once. Crook company will remove present plant to new location and carry out large increased capacity. Entire project will cost about $110,000, including equipment. George B. Franklin, 405 East Thirteenth street, is architect.

Marine City, Mich.—The Michigan Newsprint Corporation has been formed with capital of $500,000 and 5000 shares of stock, no par value, to operate a paper mill in this vicinity. Early production is planned. New company is headed by Clarence A. Bradford, 535 West Congress street, Marine City.

Sandusky, Ohio—The Hinde & Dauch Paper Company, Decatur street, is planning extensions and improvements in boiler plant at local mill, including installation of new boiler unit and auxiliary equipment. No estimate of cost has been announced.

Everett, Wash.—The Soundview Pulp Company, manufacturer of bleached sulphite pulp products, is arranging early financing through sale of common stock, to total about $1,500,000, to provide fund for proposed construction of third unit at mill, recently referred to in these columns. The expansion is estimated to cost approximately $1,300,000, including buildings and machinery. It is expected to begin work on project late in February. Leo S. Burdon is general manager.

Dallas, Tex.—The Southland Paper Mills, Inc., care of Wirt Davis, chairman of board, Republic National Bank, Republic Bank Building, Dallas, recently organized by Mr. Davis and associates, has preliminary plans under way for new pulp and paper mill on site now being selected in East Texas, to specialize in the production of newsprint, using local pine as source of raw pulpwood. New mill will comprise several large one and multi-story units, to be equipped for an initial capacity of 150 tons of newsprint per day, with power house, machine shop, pumping station and other mechanical divisions. It is estimated to cost close to $5,000,000. Proposed to begin work on project early in the spring. Interests identified with the new company, in addition to Mr. Davis, noted, include E. L. Jurth, president, Angelina County Lumber Company, Lufkin, Tex.; Arthur Temple, president, Temple Lumber Company, Texarkana, Tex.; and Nathan Adams, president, First National Bank, Dallas, all of whom are members of the committee in charge of company organization and financing. Perkins-Goodwin Company, 30 Rockefeller Plaza, New York, N. Y., pulp and paper products, also are actively identified with the project, and will be prominent in the management of the new company, as well as in the organization of the technical staff to carry out project. In advance of actual production, the new company is said to have contracted for sizable output from a number of newspapers in Texas, Oklahoma, Louisiana and Arkansas.

Cleveland, Ohio—The Euclid Paper Box Company, Inc., recently organized with capital of 250 shares of stock, no par value, plans operation of local plant for manufacture of paper boxes and containers. New company is represented by A. P. Annan, Leader Building, Cleveland, attorney.

Dayton, Ohio—The Reynolds & Reynolds Company, 931 Washington street, manufacturer of paper specialties, has plans under way for new two-story and basement plant, location noted, totaling about 30,000 square feet of floor space, for large increase in present capacity. A portion of the new structure will be used for office purposes. Cost over $60,000, with equipment. Schenck & Williams, Third National Bank Building, Dayton, are architects. E. S. Reynolds, Jr., is president.

Port St. Joe, Fla.—The St. Joe Paper Company, an interest of the Mead Corporation, Chillicothe, Ohio, and the Almours Securities, Inc., Barnett Building, Jacksonville, Fla., organized a few months ago, has awarded contract to the Virginia Bridge Company, Roanoke, Va., for structural steel framing for proposed new local pulp and paper mill, recently referred to in these columns. The order totals about 2850 tons of shapes. James Stewart & Company, Inc., 230 Park avenue, New York, N. Y., is general contractor for project, on which work is now being placed under way on main mill units. Plant will be equipped for initial capacity of about 350 tons per day, and is estimated to cost close to $6,000,000, with machinery. A townsite and other municipal developments, including timbering facilities, will make a total investment of approximately $15,000,000 in project. Sydney Ferguson, vice-president of Mead Corporation, noted, is president of new company. George F. Hardy, 305 Broadway, New York, N. Y., is consulting engineer.

Indianapolis, Ind.—Beach & Arthur, Inc., 2900 Columbia avenue, manufacturer of paper products, has arranged for lease of building at Twenty-second and Yandees streets, comprising former unit of plant of the National Motor Vehicle Company. The structure totals about 25,000 square feet of floor space, and will be improved and occupied at once by leasing company, primarily for storage and distribution.

Los Angeles, Cal.—The National Automotive Fibres, Inc., 19925 Hoover avenue, Detroit, Mich., manufacturer

AN ADDRESS To Remember

TRADE MARK

Insist on this trade-mark when buying Felts

The paper industry knows that our Felts are outstanding for their standard, uniform quality and dependability. . . . These Felts are long-wearing and they assure paper made with the finest finish. . . . They are woven to permit machine operation at top speed at all times.

We are at your service always — just address

The Waterbury Felt Co.
SKANEATELES FALLS, N. Y.

of fiber products for automobile service, is having plans completed by Harry T. Miller, 4814 Loma Vista avenue, Los Angeles, architect, for proposed new branch plant at Los Angeles, recently referred to in these columns. Site has been secured at 5000 Randolph street, and it is proposed to begin work on structure at early date. It will be one-story, estimated to cost about $250,000, with equipment, equipped to give employment to about 200 operatives.

Harrisville, N. Y.—The St. Regis Paper Company, 230 Park avenue, New York, N. Y., has arranged for the merger of its subsidiary, the Harrisville Paper Corporation, with mill at Harrisville, and the Oswego Board Corporation, Oswego, N. Y., with the parent corporation, and the consolidation will be carried out at once. The mill of the last noted company at Oswego, is now being operated under lease by Johns-Manville Corporation, 22 East Fortieth street, New York.

Fort William, Ont.—The Great Lakes Paper Company, Ltd., has plans under way for one-story and basement addition to local mill on Neebring avenue, 125 x 250 feet, to be used primarily for storage and distributing service. It is expected to begin work early in the spring. New unit is estimated to cost close to $85,000, with equipment. S. T. McCavour is chief engineer.

Donnacona, Que.—The Donnacona Paper Company, Ltd., manufacturer of fiber board products, unbleached sulphite fiber, etc., is considering preliminary plans for new local hydroelectric generating plant, to be used for service at mill. New plant will have an initial capacity of about 2250 horsepower, and is reported to cost over $100,000, with distribution facilities for power supply for mill.

New Companies

Brooklyn, N. Y.—The Cosmo Container Corporation has been incorporated with capital of 200 shares of preferred stock and 50 shares of common stock, no par value, to manufacture and deal in corrugated boxes and containers. New company is represented by Martin H. Weisman, 105 Court street, Brooklyn, attorney.

New York, N. Y.—The Montauk Paper & Tablet Company, Inc., has been incorporated with capital of 100 shares of stock, no par value, to manufacture and deal in paper products of various kinds. New company is represented by Schlesinger & Krinsky, 270 Broadway, New York, attorneys.

Chicago, Ill.—The Weiss Delcacomania, Inc., 655 South Wells street, has been organized with capital of 100 shares of stock, no par value, to manufacture and deal in paper transfer specialties, decalcomania products, etc. The incorporators include S. G. Weiss, Mervin Abrams and William S. Migatz.

Holyoke, Mass.—The American Writing Paper Corporation has been chartered in Delaware with capital of 750,000 shares of stock, no par value, to take over the assets of the American Writing Company, in connection with the recently approved reorganization plans of the latter organization.

Dayton, Ohio—The Montgomery Iron and Paper Stock Company has been incorporated with capital of 100 shares of stock, no par value, to deal in waste paper products, etc. The incorporators include H. H. Durst and I. L. Jacobson, 18 East Main street, Dayton. Last noted is company representative.

Cleveland, Ohio—The Cleveland Boxboard Corporation has been incorporated in Delaware, under direction of the Corporation Trust Company, Industrial Trust Building, Wilmington, with capital of 5000 shares of stock, no par value, to manufacture and deal in boxboard and allied paper products.

Association Officers Elected

CINCINNATI, Ohio, February 8, 1937.—At the annual meeting of the Central States Paper Trade Association held in Columbus recently E. P. Magel, president of Crescent Paper Company, Indianapolis, was elected president; Henry Zimmerman, president of the Johnston Paper Company, Cincinnati, was elected vice president; and John L. Richey reelected secretary, treasurer and counsel for the coming year.

The Middle States Wrapping Paper Association, at its annual meeting held in Columbus reelected R. W. Miller, vice president of Central Ohio Paper Company, Columbus, as president; Gale Evans of the Cincinnati Cordage and Paper Company, Cincinnati, as vice president, and John L. Richey, secretary, treasurer and counsel.

The Tri-State Wrapping Paper Association at its annual meeting in Pittsburgh reelected its officers of the previous year, i.e., F. T. Jamison, president of the Interstate Cordage and Paper Company, Pittsburgh, as president; Ed Goldsword, of the Globe Paper Company, Cleveland, vice president, and John L. Richey, secretary, treasurer and counsel.

Tissue Mills Save Family Wash

DAYTON, Ohio, February 8, 1937—Crises result in unusual situations. For instance, there was no public electric power available in Middleton because the supplying company in Cincinnati was put out of commission.

Women finally discovered the tissue mills at Excello had their own power and thence they trudged in a veritable procession with their ironing boards so they could connect up with the electric current and do their ironing. Many a wash was saved in this manner.

It was a new and novel sight to see scores of women swarming about a paper mill doing their ironing, but were the owners happy to extend this courtesy without cost? We'll say they were. "You are not in the way and it's no trouble, at all. Come any time during high water and bring your neighbors," was the friendly invitation, and many accepted.

A. W. P. Co. Mill to Be Torn Down

HOLYOKE, Mass., February 9, 1937.—A WPA project for the tearing down of the idle George R. Dickinson Division of the American Writing Paper Company, Inc., was approved at Washington last week and work will begin as soon as money is available. Only part of the mill may be torn down at the present time. If the entire mill is demolished the Federal apportionment will be $18,655 and the city share of the cost about $1200.

David P. Shirra's New Post

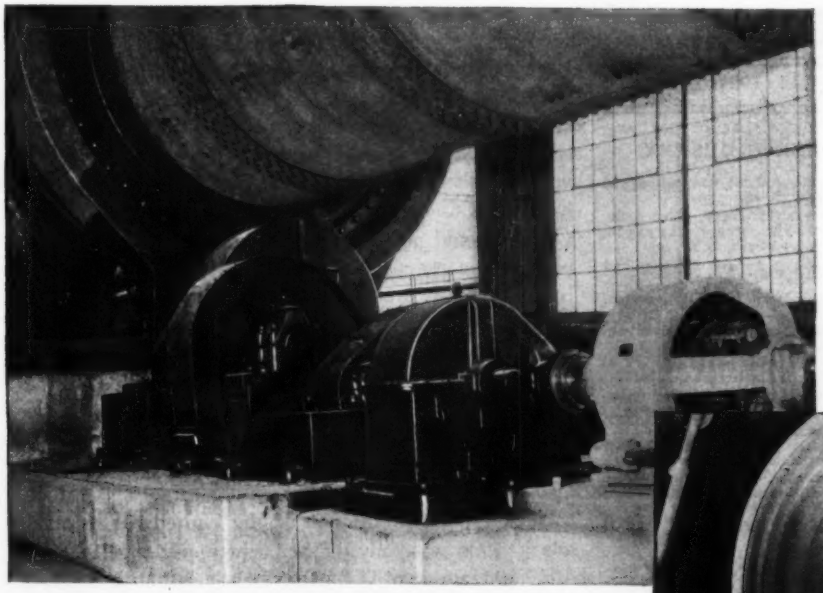
David P. Shirra has been appointed by the Aldine Paper Company as manager of a new department for the sale and distribution of Krinkle Kleer, the latest development in fabricated Cellophane. Krinkle Kleer is expected to be used widely in the fields of packaging, gift wrap, novelties, etc. The new offices of the Aldine Paper Company are located at 373 Fourth Avenue, New York.

University of Maine Alumni to Meet

The Annual Dinner and Meeting of the University of Main Alumni at the Paper Convention will take place at 6 P.M., Tuesday, February 23, at the Shelton Hotel, New York, in Parlor A.

F. W. O'Rourke, 159 High street, Boston, Mass., will be chairman of this meeting.

OPEN BEARINGS keep *cool*... even where it's *hot*



TAURAK is the ideal open bearing lubricant, where there is external heat, as in kilns, driers, etc.

TAURAK is perfect for bearings of dryer rolls of paper machines. It will neither "drag out" nor "glaze".

SOME open bearings run cool . . . and some run *hot.* Our research department has found out why.

When designed for grease lubrication, one must be *selected to lubricate efficiently at the skin temperature of the bearing.*

This is why Texaco men take pyrometric readings of the bearings . . . to learn which grade of TAURAK is most suitable.

This scientific selection assures each bearing getting a grade of TAURAK that will neither "drag out" and waste, nor "glaze" and fail to lubricate.

Try TAURAK, for cooler bearings, even though located in hot places.

A Texaco representative will be glad to provide practical engineering service to prove the economy of Texaco TAURAK.

THE TEXAS COMPANY
135 East 42nd Street, New York City
Nation-wide distribution facilities assure prompt delivery

TEXACO

TEXACO *Industrial Lubricants*

PAPER TRADE JOURNAL

ESTABLISHED 1872

Reg. U. S. Pat. Off.

George S. Macdonald, Pres. *Joseph P. Horgan, Secy.*

Executive and Editorial Offices, 15 West 47th St., New York, N. Y.

Henry J. Berger, *EDITOR* — Herbert J. Laughton, *Associate Editor*

Ronald G. Macdonald, *Editor Technical Section* — Lynne M. Lamm, *Washington Correspondent*

Price, Per Copy, 10 Cents — United States, Per Annum, $4.00

Canada and Foreign Countries in Postal Union, $6.00

Member Audit Bureau of Circulations

Vol. CIV New York, February 11, 1937 No. 6

COMING EVENTS IN THE PAPER INDUSTRY

AMERICAN PAPER AND PULP ASSOCIATION, Sixtieth Annual Convention and meeting, Waldorf-Astoria Hotel, New York, February 22-26.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Convention, Waldorf-Astoria Hotel, New York, February 22-25. Annual Luncheon, Waldorf-Astoria Hotel, Wednesday, February 24.

SALESMEN'S ASSOCIATION OF THE PAPER INDUSTRY, Annual Meeting and Luncheon, Waldorf-Astoria Hotel, New York, Tuesday, February 23.

NEW YORK ASSOCIATION OF DEALERS IN PAPER MILL SUPPLIES, Annual Banquet, Hotel Commodore, New York, February 24.

NATIONAL PAPER TRADE ASSOCIATION OF THE UNITED STATES, Convention, Waldorf-Astoria Hotel, New York, February 22-26.

NEW ENGLAND SECTION, Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Nonotuck Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION, Technical Association of the Pulp and Paper Industry—Fourth Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION, Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION, Technical Association of the Pulp and Paper Industry—First Thuraday of each month at the Park-American Hotel, Kalamazoo, Mich.

AMERICAN PULP AND PAPER MILL SUPERINTENDENTS ASSOCIATION, Annual Meeting, Springfield, Mass., June 23-25.

PAPER INDUSTRY ADVANCES

Closing the fourth year of uninterrupted improvement, the paper industry entered 1937 with some of its divisions in new high ground. After an increase of 15 to 30 per cent in the 1936 tonnage production, many mills started January with operations at capacity, backlogs the bulkiest in eight or ten years, and estimated employment in the pulp and paper industry at 150,000, as against 128,049 in 1929. Orders on the books of wholesalers indicated an extension of the 15 to 40 per cent gain in the 1936 volume over that of 1935, as the industrial uses of paper multiplied.

While the recovery of prices and the persistent widening of both production and distribution were outstanding in 1936, the phenomenal expansion in the kraft paper and the kraft board sections superseded all other developments. Estimated total paper production for 1936 of 12,000,000 tons was larger by 16.4 per cent than the 10,308,000 tons in 1935, and exceeded the all-time peak established in 1929 at 11,140,000 tons by 7.7 per cent. The progress made during the last your years is revealed by contrast with the 1932 production, which amounted to only 8,000,000 tons.

Large-scale rehabilitation work and plant additions already are under way at some centers, as mills are endeavoring to build up inventories in order to avoid last year's delivery delays. All lines seem destined for higher prices, due to the rapid increase in the cost of production and imminent wage boosts. Besides forcing quotations upward, these are making it more difficult for all branches to obtain a profit on the advance. These were some of the major developments revealed by a survey of the paper industry, which has just been completed by DUN & BRADSTREET, INC.

Running from one to six weeks behind their scheduled delivery dates, most of the paper mills entered 1937 with the heaviest backlogs since 1929, despite an increase of 15 to 30 per cent in 1936 over the tonnage production of 1935. Some manufacturers had the best year since the war and the majority since 1929. The surge in the demand for kraft and other utility papers gave mills of that type the largest output on record, even though selling prices did not advance in keeping with raw material and operating costs.

Book and writing paper manufacturers were handicapped by the substantial shortage of high-grade pulp, which pushed up prices 40 per cent more during the last half of 1936. Fine paper mills, although handling a larger volume, could not operate profitably with the existing disparity between costs and selling prices. For every month in 1936 total production of newsprint for the United States and Canada topped that of the comparative one in each of the five years preceding and the last seven of 1930.

Marking the first time in history that more than 300,000 tons of newsprint were made in a single month, Canadian mills in October turned out 301,106. Added to the 81,027 tons of United States mills, October production of 382,133 also set a new record. Amounting to 4,100,231 tons, the total newsprint production of the United States and Canada in 1936 was only 0.5 per cent under the 1929 peak of 4,121,103, and was 11.8 per cent larger than in 1935.

Except for the moderate recession in December, the broadening wholesale distribution of paper was unbroken during 1936, with prospects for an extension of the improvement during the current year. Volume was enlarged by 15 to 40 per cent from the 1935 proportions, with virtually all lines included in the spreading demand. Calls for the more expensive grades of bond and ledger papers were in keeping with the faster business tempo and bulkier orders for book paper reflected the gains in the publishing trades.

Building and industrial papers moved out at the best rate in years, while printers' stock and stationery came into the foreground for the first time since 1929. Consumption of tissues was somewhat larger than in 1935, reaching 400,000 tons for all grades, including basis 18-pound and lower weights. Novelties continued to gain in popularity, the diversified styles used by the greeting card trade running to the largest quantity on record in 1936.

Kraft and wrapping paper consumption in 1936 expanded to a new all-time high, surpassing that of 1929 by nearly 60 per cent. Kraft paper converted into bags alone was in excess of 500,000 tons. For both kraft wrapping and bag paper the total was around 1,435,000 tons, or a rise

of 30 per cent from the 1,103,000 in 1935. Shippers also used more paperboard per unit of shipment than in 1929, which lifted the consumption of kraft board to a peak.

Outstanding strength in practically all divisions characterized the price structure during 1936. Coated paper was advanced around $12 and uncoated $10 a ton. Some coated grades brought as much as $17 more than the quotation prevailing in January, 1936, due to the shortage of imported pulp used in the manufacture of these papers.

Attempts to contract for pulp supplies ahead into 1938 revealed that European mills were sold out for that year. The average rise in sulphites, books, and groundwoods amounted to about $5 a ton. Both board and kraft were scheduled for advances during the first quarter, and nearly all other grades indicated definite inclining trends.

Newsprint contract price for 1937 was marked up to $42.50 per ton, delivered at New York and Chicago, from the 1936 level of $41. The latter was the first increase since April, 1933, when it was reduced from $45 to $40 a ton, the lowest quotation in thirty years. The price has been dropping steadily since 1923, when it was $81.80.

Eastern Paper Salesmen Meet

There was an excellent attendance at the regular meeting and luncheon of the Eastern Division of the Salesmen's Association of the Paper Industry held in the Florentine Room of the Hotel Lexington, New York, on Monday.

W. P. Good, secretary of the American Pulpwood Association; R. S. Kellogg, secretary of the News Print Service Bureau; and Charles W. Boyce, secretary of the American Paper and Pulp Association, discussed the pulpwood industry situation in an instructive and interesting manner and proved to the satisfaction of the gathering that there is enough pulpwood in the United States to supply the requirements of the paper industry indefinitely.

American Tissue Mills Elects

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., February 9, 1937.—The American Tissue Mills, Inc., has elected the following officers: President, Benjamin F. Perkins; vice president, Mrs. Malvina E. Perkins; treasurer, J. Lewis Perkins; clerk, Eleanor Walsh; directors, the foregoing, Attorney Thomas C. Maher and Attorney N. P. Avery.

Mead Declares Preferred Dividend

[FROM OUR REGULAR CORRESPONDENT]

DAYTON, Ohio, February 8, 1937—The directors of the G. H. Mead Corporation last week declared the regular dividend of $1.50 per share on the preferred stock. The dividend is payable March 1 to stock of record February 15.

Mt. Tom Announces Wage Increase

[FROM OUR REGULAR CORRESPONDENT]

NORTHAMPTON, Mass., February 9, 1937.—The Mt. Tom Sulphite Company at Mt. Tom Junction has given a 10 per cent increase in wages to its employees. About 125 are affected.

Production Ratio Report

The following statistics are based upon paper production reports to the American Paper and Pulp Association:

COMPARATIVE MONTHLY SUMMARIES

Months	1937	1936	1935	1934
January	89.7%	76.1%	65.8%	.....
February	.....	77.9%	70.0%	.....
March	.....	76.0%	70.5%	.....
April	.....	82.3%	70.0%	.....
May	.....	81.6%	69.4%	.....
June	.....	80.7%	72.3%	.....
July	.....	77.3%	64.9%	.....
August	.....	81.5%	70.9%	.....
September	.....	80.5%	71.9%	58.2%
October	.....	87.6%	75.6%	64.7%
November	.....	88.0%	75.3%	61.7%
December	.....	85.9%	71.2%	59.6%
Year Average	.....	81.3%	70.5%	.....
Year to Date, First 4 weeks	89.7%	75.5%	65.2%	.....

COMPARATIVE WEEKLY SUMMARIES

CURRENT WEEKS, 1937		CORRESPONDING WEEKS, 1936	
*January 9	92.1%	January 11	75.8%
*January 16	90.3%	January 18	77.1%
*January 23	88.6%	January 25	76.7%
*January 30	87.2%	February 1	78.6%

The following statistics show the number of mills reporting by ratio groups:

	Number of Mills Reporting, Current Weeks			
Ratio Limits	Jan. 9, 1937	Jan. 16, 1937	Jan. 23, 1937	Jan. 30, 1937
0% to 50%	49	52	50	32
51% to 100%	281	272	261	179
Total Mills Reporting	330	324	311	211

* Subject to revision until all reports are received.

PAPERBOARD OPERATING RATIOS

According to reports from the National Paperboard Association, per cents of operations, based on "Inch-Hours", were as follows:

Months	1936	1935	1934	Months	1936	1935	1934
January	61%	61%	....	July	69%	59%	....
February	67%	67%	....	August	75%	65%	....
March	68%	67%	....	September	76%	69%	62%
April	70%	61%	....	October	82%	76%	63%
May	68%	61%	....	November	79%	70%	56%
June	68%	65%	....	December	74%	60%	52%

Week ending Jan. 9, 1937—77%
Week ending Jan. 16, 1937—79%
Week ending Jan. 23, 1937—82%
Week ending Jan. 30, 1937—81%

Bids for Government Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., February 10, 1937.—The Government Printing Office has received the following bids for 53,700 pounds (300,000 sheets) of white antique book paper; Old Dominion Paper Company, 5.047 cents per pound; Walker-Goulard-Plehn Company, 5.71 cents; John F. Post, Inc., 5.68 cents; Cauthorne Paper Company, 5.41 cents; Whitaker Paper Company, 5.51 cents; R. P. Andrews Paper Company, 5.46 cents; Barton, Duer & Koch Paper Company, 5.41 cents; Fitchburg Paper Company, 5.71 cents; Stanford Paper Company, 5.41 cents; Paper Corporation of U. S., 5.67 cents; and Mathers-Lamm Paper Company, 5.387 cents.

Heads Government Printing Committee

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., February 10, 1937 — Representative Lambeth of North Carolina was elected chairman and Senator Hayden of Arizona, vice-chairman of the Joint Congressional Committee on Printing at an organization meeting last week. This is the first time that a member of the House has ever headed this committee. This is the committee that handles all of the paper matters for the Government Printing Office. The other members of the Committee include Senators Walsh of Massachusetts and Vandenberg of Michigan, and Representatives Barry of New York and Rich of Pennsylvania.

QUALITY GOES UP . . . .

AND THE COST COMES DOWN

CYANAMID RESEARCH PRODUCES MORE EFFICIENT WAX SIZE

Akin to progress inspired by research in the automotive field is the steady advance in paper making. Cyanamid has spent much labor and research in the development of finer wax sizes for the paper industry. Among the most important of these is 5C ALWAX SIZE, a new product that is not only more efficient but better in color and easier to handle than former sizes.

All Cyanamid sizes, of which there is a complete line, are made with special care and under complete chemical control to assure the utmost in quality and uniformity. Our six Size plants, located at convenient points in various sections of the country to give quick service, assure you delivery at lowest delivered cost.

You are invited to take advantage of Cyanamid's large scale resources and efficient technical cooperation in keeping your quality up and your cost down. Our representatives will be glad to discuss your problems.

American Cyanamid & Chemical Corporation

30 ROCKEFELLER PLAZA • NEW YORK, N. Y.

Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

Pulp and Paper Industry Literature Review

Abstracts of Articles and Patents Compiled by the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Raw Materials

Problem of Utilizing Tobacco Stems. A. Shmuk and G. A. Korzheniovskii. State Inst. Tobacco and Makkorka Ind. (U. S. S. R.) No. 125: 3-14 (1935); C. A. 30:6551.—The contents of moisture, cellulose, pentosans, benzene-alcohol extract, lignin, total carbohydrates and ash are given for the stems of a number of tobacco varieties. The pentosan is hydrolyzed to xylose, which is removed, leaving a residue from which cellulose can be obtained.—C.J.W.

The Characteristics of Tobacco Stems as a Source of Cellulose. G. A. Korzheniovskii and S. M. Kashirin. State Inst. Tobacco and Makkorka Ind. (U. S. S. R.) No. 125:15-28 (1935); C. A. 30:6552.—The authors give the analytical procedures for the determination of cellulose, lignin and pentosans and analyses of a series of tobacco stems, with special reference to the cellulose content. The nitric acid and alkali methods were compared for the extraction of cellulose.—C.J.W.

Chemical Work of the Puerto Rico College Station. R. Arroyo. Puerto Rico Coll. Sta. Rept. 1934, 46, 47, 151-157; C. A., 30:6594.—Data are reported on a method for the production of alpha-cellulose from cane bagasse and foliage, in which the organic aliphatic acids (especially those inexpensively prepared from blackstrap molasses) can be substituted for nitric acid.—C.J.W.

Cellulose

Heats of Swelling of Cellulose in Water and Some Commercial Organic Solvents at 25°. K. P. Mishchenko and M. Z. Pronina. J. Applied Chem. (U. S. S. R.) 8:1164-1169 (1935); C. A. 30:6553.—Heats of swelling of wood-pulp fragments, containing 5.89% water and dried at 98-101° to a constant weight, in water, etc., were measured with a mercury thermometer in the Bose-Vrevskii calorimeter at 25°. The inconclusive results indicate that the volume increase at a maximum swelling of cellulose for the different solvents is in the following decreasing order: formic acid, water, ethyleneglycol, glycerol, methyl alcohol, paraffin oil and triacetin. The effect for the last two is practically zero, which in the case of triacetin with the only endothermic effect, may be the result of some process other than swelling.—C.J.W.

Determination of Cellulose. A. I. Luytenberg and E. A. Mirer. J. Applied Chem. (U. S. S. R.) 8:1184-1193 (1935); C. A. 30:6553.—The "cellulose" extracted by the Henneberg-Stohmann method is of variable composition; the Kurschner-Hanak method is preferred.—C.J.W.

Lignin

What is Lignin? E. Schmidt. Papier-Fabr. 34, no. 21:161-163 (May 24, 1936.) In the discussion following a paper by Hilpert, Schmidt recalls the theory of Wislicenus on the formation of lignin from carbohydrates in the plant.—C. J. W.

The Action of Benzaldehyde on Lignin. N. I. Nikitin and I. M. Orlova. J. Applied Chem. (U. S. S. R.) 8:1402-1408 (1935); C. A. 30:6557.—Elm lignin, heated at 120° in a sealed tube with 12 times its weight of benzaldehyde, dissolves. In the presence of hydrochloric acid, 95° is sufficient. Under these conditions benzaldehyde will not dissolve lignin directly from wood. Centrifuging the solution gives 1-6 per cent insoluble material. Ether precipitates 60-70 per cent and petroleum ether a further 8-25 per cent of the substance. The residue is obtained by distilling off the benzaldehyde. The fractions appear to be decomposition products of lignin.—C. J. W.

Action of Ethylene Oxide Upon Wood and Lignin. II. N. I. Kikitin and T. I. Rudneva. J. Applied Chem. (U. S. S. R.) 8:1176-1183 (1935); C. A. 30:6557.—Lignin, obtained from spruce flour by the method of Willstatter and Kalb, was treated with 18 per cent sodium hydroxide for 24 hours, and then, after pressing out, with 2-4 parts ethylene oxide in a sealed tube at 70-72° for 24 hours. The crude lignin hydroxyethel ether was separated with water and dried in alcohol and ether and then in a vacuum desiccator to a constant weight. After hydrolysis with 5 per cent sulphuric acid for 5 hours a pure ether is obtained identical with the product obtained from spruce flour by the same method. The ether is an amorphous, insoluble product, containing 38.76 per cent of the $-OCH_2CH_2OH$ group and 5.18 per cent HO groups capable of acetylation. It cleaves its $-OCH_2CH_2OH$ group with hydrogen iodide at 135-40°, but not boil-

ing 5 per cent sulphuric acid, which indicates the presence of a simple ether bond. It follows that lignin reacts with ethylene oxide similarly to cellulose.—C. J. West.

Sulphite Process

Recent Investigations Concerning the Sulphite Process. E. Hägglund. Papier-Fabr. 34, no. 34:313-319 (Aug. 23, 1936).—The author describes certain experimental sulphite cooks in a revolving digester of stainless steel. Although the cook proceeded in the usual way and the color of the liquor was still light, the resulting pulp could not be beaten in a Lampen mill, because no felting of the fibres took place. A comparative cook under identical conditions carried out on a stationary digester yielded a satisfactory pulp. The microscopic investigation of the apparently whole fibre from the first cook revealed that each individual fibre was broken into a number of small fragments. Further studies showed that this disintegration could not be traced back to the mechanical treatment through the revolving digester, but to a chemical attack of the individual fiber by the cooking acid at an earlier stage. The same result was obtained when isolated wood fibers, instead of the usual chips, were cooked in a stationary digester. The strength of the fibers decreased to such an extent that they fell apart on beating. This experience has been confirmed in practical operation; sulphite mills employing revolving digesters have discontinued their use and installed forced circulation in their place.—C. J. W.

Alkaline Processes

Industrial Evolution of the Chlorine Process for Cellulose Production—History and Prospects. Umberto Pomilio. Chimica e industria (Italy) 18:6-13 (1936); C. A. 30:6553.—Chlorination, lixiviation and bleaching are now carried out by continuous processes.—C. J. W.

Cellulose Suitable for Use in the Production of Viscose, Etc. Henry Dreyfus. U. S. pat. 2,045,345 (June 23, 1936).—Lignocellulosic material such as sawdust is treated to remove resinous substances (as by the use of a 5 per cent caustic soda solution) and is then treated with excess alkali solution such as an 18 per cent caustic soda solution and the product is caused to react with carbon disulphide to form the xanthate; lignin and other insoluble matter is removed from the solution formed, and cellulose is regenerated from the solution (as by hydrochloric acid).—A.P.-C.

Treatment of Cellulose. Henry Dreyfus. U. S. pat. 2,054,854 (Sept. 22, 1936).—Cellulose of suitable purity for the manufacture of cellulose esters or ethers is obtained by subjecting chemical wood plup to successive treatments, first with hot dilute alkali and then with cold more concentrated alkali, which may be followed by treatment with a lower fatty acid (suitably acetic).—A.P.-C.

Coagulation of Sulphate Pulp Liquors by Several Electrolytes. I. I. Shtakel'berg and A. A. Lifshitz. J. Applied Chem. (U. S. S. R.) 8:1421-1430 (1935); C. A. 30:6560.—The dilute sulphate liquors (black liquors) can be freed from 50-78 per cent of their soluble acid to a pH purities by adding hydrochloric or sulphuric acid to a pH of 5-5.5, zinc chloride or zinc sulphate to a pH of 7.6 or aluminum nitrate or aluminum sulphate to a pH of 8. The impurities separate as a gel which can be removed by centrifuging.—C.J.W.

Black Liquor Recovery. Harold Lundin and William H. Bitner. U. S. pat. 2,054,727 (Sept. 15, 1936).—In the recovery of sulphate black liquor an amount of sodium sulphate is used that is considerably greater than that required to compensate for normal loss of alkali. A portion of the causticized white liquor (corresponding to the excess of sodium sulphate used) is withdrawn and treated with zinc oxide to produce zinc sulphide and caustic soda. The zinc sulphide is separated and may be used as a paper filler or may be roasted to regenerate zinc oxide and produce sulphur dioxide; the caustic soda solution is evaporated for recovery of the alkali.—A.P.-C.

Recovery of Black Liquor. Charles L. Wagner assignor to The Babcock & Wilcox Co. U. S. pat. 2,050,400 (Aug. 11, 1936).—Concentrated black liquor is sprayed downwards into a vertical furnace against a rising current of combustion gases, whereby the liquor is first dried, then destructively distilled and finally burnt completely. Controlled amounts of primary and secondary air are introduced at suitable levels in the furnace, and the fused salts collect on the hearth and are withdrawn in any convenient manner.—A.P.-C.

Mechanical Process

Production of Pulverulent Cellulose. George A. Richter assignor to Brown Co. U. S. pat. 2,054,301 (Sept. 15, 1936).—Cellulose fiber is mechanically reduced in presence of a liquid vehicle (preferably water) to form particles of widely varying sizes. The particles of the desired size are separated by screening; the coarse fraction is returned for further reduction, and the fine fraction is dewatered to a substantially dry condition and the particles cleaved apart or separated by suitable mechanical treatment.—A.P.-C.

Pulp Grinder Temperature Control. Clayton D. De Mers assignor to Taylor Instrument Companies. U. S. pat. 2,050,749 (Aug. 11, 1936).—De Mers' U. S. pat. 1,806,238 provides means for maintaining the temperature of a pulp-grinding stone constant. In order to produce uniform quality groundwood the proper operating temperature should vary according to the sharpness of the stone. According to the present invention, as the stone becomes duller, the control point of the temperature regulator is automatically adjusted so that the normal demand for cooling water is controlled to an average uniform rate of flow.—A.P.-C.

Magazine Grinder. Charles A. Waterous. U. S. pat. 2,053,505 (Sept. 8, 1936).—In order to prevent excessive pressure being exerted on the stone by the logs, spikes or pins are provided at suitable points which may be driven into the ends of a row of logs across the width of the magazine and prevent their further downward movement, the means actuating the spikes being controlled by the pressure shoe or by a shut off door which may be used to close the top of the grinder pocket.—A.P.-C.

Segmental Pulp Stone. Thure Larsson, assignor to Norton Co. U. S. pat. 2,054,771 (Sept. 15, 1936).—The crevices between the abrasive segments are filled with a cellular hard rubber composition.—A.P.-C.

Pulp Purification

Pulp Purification. N. Wunderlich. Papier-Fabr. 34, No. 26:234-239 (June 28, 1936).—The degree of cleanliness of pulps required will vary according to the further application of these pulps. Two dirt count methods are in use. Either the number of dirt particles irrespective of their size is counted per unit area or the total area of dirt particles per unit surface of paper is given. The principles of the different equipments for removing dirt from pulp are discussed, such as rifflers and centrifuges, which separate foreign particles according to the rate of sedimentation, and knotter screens, which sort the stock according to the size of the fibers. Knotters which travel in an elliptical path by virtue of the shake are the most efficient for this purpose, even at high pulp consistencies. —C.J.W.

Process for Purifying and Bleaching Chemical Pulp. Francesco C. Palazzo and Fortunato Palazzo. U. S. pat. 2,055,827 (Sept. 29, 1936).—Pulp at a consistency of about 8% is treated with chlorine water in amount sufficient to chlorinate the lignin without exerting any appreciable bleaching action (about 2 to 3 per cent chlorine on the weight of the pulp). After washing and dehydrating it is treated at or above atmospheric pressure and at 80° C. or higher with a solution of sodium sulphite made alkaline with sodium carbonate and (or) sodium hydroxide, the conditions of the treatment depending on the degree of purification required. The pulp is finally bleached with an acid potassium permanganate solution, and then washed with sulphurous acid solution and water—A.P.-C.

Beating

Characteristics of Beating, Fiber Measurements and Fiber Fractionation. M. Steinschneider, H. Kross and L. Imgrund. Papier-Fabr. 34, No. 23:177-183 June 7, 1936).—It has been definitely established that different pulps, beaten in various beating instruments to an identical degree of beating, are not directly comparable. This work is intended to show the differences between two unbleached sulphite samples from the same lot of pulp, with regard to fiber length, behavior on fractionation (4 fractions), and strength properties, when beaten in five different equipments (two commercial and three laboratory) to 20, 50 and 70 ° S. R. each. The microscopic analysis revealed that screen fractionation does not separate beaten fibers according to their actual lengths, chiefly on account of the roughened fiber side walls and their adhering to each other by fibrils; it gives, however, a measure of the degree of roughening on which strength properties depend. Roughened fibers, although shortened, will give high strength values, whereas smooth fibers, even when embedded in mucilage, are liable to slide past each other. However, when the degree of roughening exceeds a certain limit, the strength of the individual fiber suffers and a decrease in the strength properties of the sheet is the result of prolonged beating. Photomicrographs of the sample beated to 70° indicate that the beating degree does not depend upon fiber length but chiefly upon the type of beating equipment used. The commercial beater with metal bars causes the greatest, the commercial stoneware beater the least shortening of the fibers. The values for the three laboratory equipments lie all within these two extremes; the latter, however, treat the pulp far more intensively than either of the commercial beaters, which is indicated by the well-roughened fiber walls.—C.J.W.

Pulp Hydrator. Harold D. Wells. U. S. pat. 2,055,956 (Sept. 29, 1936).—Intermeshed gear teeth are provided on relatively rotatable members, and the pulp is passed between these members, so that the teeth create high pressure as they mesh and as they unmesh create suction or vacuum to some extent.—A.P.-C.

Breaker Beater and Refining Engine. Joseph E. Bond. U. S. pats. 2,055,142 and 2,055,143 (Sept. 22, 1936).—*No. 2,055,142*—Pulp laps are broken and defibered at high consistency (up to 14 per cent by feeding in presence of water to rapidly rotating blades (about 5,000 ft. per min., peripheral speed) that are constructed to hold back hundles or pieces of pulp while the body of pulp is forced past the blades. The partially defibered stock is circulated through a trough (similar to a beater trough) and back to the blades until properly reduced. *No. 2,055,143*—Pulp treated in the machine described in the preceding patent is separated into completely and incompletely reduced fiber; the latter is returned for further treatment and the former fed directly to a refiner at a consistency of up to 10 per cent.—A.P.-C.

Apparatus for Controlling the Processing of Pulp Stocks. Clayton D. De Mers assignor to Taylor Instrument Companies. U. S. pat. 2,051,202 (Aug. 18, 1936).—In the linkage mechanism supporting the free end of the lighter bars in which the beater roll is mounted. There is provided an arrangement for continuously weighing the roll, the weight being a function of the consistency of the stock. Automatic mechanism is provided for changing the position of the roll in accordance both with time and with the varying weight of the roll. A similar regulating arrangement is provided for adjusting the position of the plug of a jordan to maintain a predetermined pressure in accordance with the varying consistency of the stock passing there through.—A.P.-C.

Sizing

Dispersion of Nonsaponifiable Resin and Process of Making the Same. John A. Kenney assignor to The Barrett Co. U. S. pats. 2,051,409 and 2,051,410 (Aug. 18, 1936).—*No. 2,051,409*—A coumarone indene resin having a melting-point below 40° C. is melted and mixed by violent agitation (suitably with a high speed stirring device) with two parts of sodium silicate solution until a relatively stable emulsion is obtained. *No. 2,051,410*—A coumarone indene resin having a melting-point of from 127° to 142° C. is ground so that about 90 per cent passes through a 200-mesh sieve. The ground resin is mixed with a solution of sodium silicate and grinding is continued until a substantially stable emulsion is obtained. The emulsions obtained according to both patents are suitable for sizing paper.—A.P.-C.

Dry Size. John F. Fredriksson assignor to American Cyanamid and Chemical Corp. U. S. pat. 2,050,996 (Aug. 11, 1936).—Initially dry rosin size is obtained without passing through the step of solution by mixing together sufficient caustic soda (preferably in the form of a cold saturated solution) and powdered rosin in such a manner that at no time during the procedure will the temperature rise to a detrimental degree.—A.P.-C.

Method of Making a Dry Rosin Size Composition. Thomas W. Asbury, Richard A. Asbury and John F. Fredriksson, assignors to American Cyanamid and Chemical Corp. U. S. pat. 2,050,997 (Aug. 11, 1936).—Lump rosin is chilled and ground at a temperature below 70° F. Caustic soda is dissolved in water to form a solution of over 50 per cent concentration; the solution is boiled for an appreciable length of time, chilled, and mixed with the rosin under such conditions as to maintain the temperature practically constant at about 65° F. The mixture is finally chilled in a substantially dry atmosphere to arrest any progressing reaction.—A.P.-C.

Sized Paper with an Alkaline Filler. Harold R. Rafton assignor to Raffold Process Corp. U. S. pat. 2,045,052 (June 23, 1936).—A fibrous web containing an alkaline filler is treated with a water-insoluble sizing such as rosin dissolved in a solvent and the liquid content of the web is substantially completely evaporated without fluxing of the sizing in the web but with a substantially uniform sizing effect.—A.P.-C.

Manufacture of Sized Paper. Charles R. Outterson assignor to Bennett, Inc. U. S. pat. 2,055,799 (Sept. 29, 1936).—Completely saponified rosin size is first added to the stock in the beater in amount at least sufficient to "peptize" the water; a size emulsion containing unsaponified sizing agents (free rosin, wax, etc.) is added and precipitated with alum as usual.—A.P.-C.

Sizing Composition and Process of Making Same. Max Engelmann, assignor to Bayer-Semesan Co. U. S. pat. 2,052,170 (Aug. 25, 1936).—A natural resin containing abietic acid is ground in dry form with an alkali in

dry form, such as caustic soda, sodium carbonate, sodium silicate, or the corresponding potassium salts, or mixtures of substances which produce alkali in contact with water (slaked lime and sodium carbonate, or barium hydroxide and sodium sulphate).—A.P.-C.

Process of Manufacturing Paper and Paper Board. Levis M. Booth. U. S. pat. 2,050,262 (Aug. 11, 1936).—In order to prevent liberation of carbon dioxide, a suitable alkaline reagent (such as sodium phosphate, borax, sodium silicate or alkali hydroxide) is added to the stock (preferably just before it is delivered to the paper machine).—A.P.-C.

Use of Bituminous Emulsions in the Paper Industry. Fritz Hoyer. Papier-Fabr. 34, No. 29:275-279 (July 19, 1936).—The successful application of bituminous emulsions to paper pulp depends to a great extent upon the quantity of emulsifier and the emulsifying temperature; both factors have to be determined empirically. Dyeing with mineral colors is possible, although not with all types of emulsions. The best method of addition to the pulp is in the hollander with lifted roll, after the actual beating process is concluded. Bituminous emulsions are also used for pasting two or more webs together; this method can be employed in the case of suitable light papers, because the emulsion does not strike through; even white cardboards have been pasted in this manner. Bituminous papers find many applications, chiefly in the wrapping and shipping container industry, but also for electrical, and heat and moisture insulating purposes, for floor coverings and roofings, bookbindings, etc.—C.J.W.

Drying

Heat Produced By Electricity in the Paper Industry. Papier-Ztg. 61, No. 67:1246-1247 (Aug. 19, 1936).—A discussion is given of the possibility of heating electrically the drying cylinders in a paper machine. Direct heating involves the problem of overheating and complicated regulators; the use of electrically generated steam is possible, but is a matter of cost.—C.J.W.

Multiple Cylinder Web Drier. Ernst Schmidt. U. S. pat. 2,054,391 (Sept. 15, 1936).—No drier felts are used. Each of the drier cylinders is surrounded by a strainer perforated jacket wall spaced a small distance from the cylinder body, and at the lines of engagement and departure of the web spring-pressed guide rolls are provided in place of the usual felt guide rolls. Dry warm air is blown into the space between the perforated jacket wall and the body of the cylinder, through adjustable nozzles directed towards the perforated jacket in the free circumferential portion lying between the guide rolls.—A.P.-C.

Coated Papers

Sheet or Film Forming or Coating Composition. Allen Abrams and Charley L. Wagner, assignors to Marathon Paper Mills Co. U. S. pats. 2,054,112, to 2,054,114 (Sept. 15, 1936); Allen Abrams, Charley L. Wagner and George W. Forcey, assignors to Marathon Paper Mills Co. U. S. pats. 2,054,115, and 2,054,116 (Sept. 15, 1936).—*No. 2,054,112*—A thermoplastic composition is prepared by dissolving together from 6 to 30 per cent by weight of india rubber and from 94 to 70 per cent of paraffin at such temperature and within such a length of time as to produce a solution having a viscosity of at least 8,000 sec. (Scott viscosimeter at 90° C.), and cooling the solution before the viscosity has been reduced below 8,000 sec. *No. 2,054,113*—Paper is coated by passing the web over a heated surface into contact with a mass resting on the web and prepared as described in the preceding patent. *No. 2,054,114*—A flexible self-sustaining sheet material is produced by feeding the above paraffin-rubber composition on to a travelling chilled surface, doctoring the composition by applying thereto a heated surface maintained in closely spaced relation to the chilled surface, and stripping the film thus formed from the chilled surface. *No. 2,054,115*—Flexible, self-vulcanizing sheets, films or coatings are formed by preparing a separate batch comprising molten wax as a major ingredient, rubber, vulcanizing agent and an activator, and a separate batch comprising molten wax as a major ingredient, rubber and an accelerator, mixing the batches, and forming into films, etc. *No. 2,054,116*—The previously described rubber-paraffin composition is used as adhesive to bind the laminations of composite paper or board.—A.P.-C.

Decalcomania Paper and Transfer. Ferdinand W. Humphner, assignor to Mid-States Gummed Paper Co. U. S. pat. 2,050,795 (Aug. 11, 1936).—A decalcomania paper constructed to permit ready separation of a main or continuous body into individual transfers when the paper base is moistened comprises a paper base coated with a watersoluble adhesive, over which is applied a coating of lacquer; and solvents for the lacquer are printed over the lacquer to form weakened lines therein.—A.P.-C.

Method and Apparatus for Coating Paper. Orme E. Cheatham, assignor to International Paper Co. U. S. pat. 2,053,601 (Sept. 8, 1936).—The coater is designed so that by suitable adjustment it may apply either a heavy or a very light coating (as little as 3 lb. per standard ream, 25 x 38 in., 500) on either one or both sides of the sheet. The coater is located in the basement of the paper machine room, at a suitable point of the drier section. The incompletely dried paper is passed between two large rolls and the coating is applied to one surface of the sheet so that on passing in the nip of the 2 rolls the layer of coating is reduced to a thickness slightly greater than the final desired thickness. It is immediately taken out of contact with these rolls, passed around a smoothing roll and then over a series of small smoothing rolls which rotate in contact with the surface of the upper of the pair of large rolls. A second similar unit is provided for two-face coating. The coated paper is then passed through the remainder of the drier section.—A.P.-C.

Coating Paper. Sylvester Boyer and LeClare F. Parmenter, assignors to S. D. Warren Co. U. S. pat. 2,051,403 (Aug. 18, 1936).—Paper is passed through a coating bath that is decidedly more viscous than those generally employed, and then travels vertically past two hard bronze wiper bars (one on each side of the sheet) to remove excess coating and through a vertical heated drying chamber. The active surfaces of the wiper bars are cylindrical and their under surfaces slope upwards from the point of contact with the paper to prevent surplus coating material from running back and caking in the wipers.—A.P.-C.

Method of Making Insulating Material and Apparatus Therefor. John F. Palmer. U. S. pat. 2,055,877 (Sept. 29, 1936).—A paper sheet is sprayed on one side with concentrated rubber latex, passed over a drier roll, and corrugated by means of suction by passing around a longitudinally fluted roll constructed so that vacuum is applied along the bottom of each groove. A facing sheet is sprayed with latex and applied to the latex-coated surface of the corrugated sheet. The combined sheet is passed under one or more circumferentially rigid rolls each bearing on a plan or platen roll, to form corrugations transverse to those previously formed. The two-ply sheet is coated on both sides with latex and dried. Two or more sheets may be combined to build up an insulating block.—A.P.-C.

Effect of Varying the Concentration of Combined Sulphur Dioxide in Soda Base Sulphite Pulping*

By G. H. Chidester[1]

Abstract

The yields and strengths of pulps that have been digested to approximately the same degree in approximately the same time with soda base sulphite liquors of constant initial total sulphur dioxide concentration but with increasing concentrations of combined sulphur dioxide, passed through a maximum at 2 to 3 per cent combined sulphur dioxide. Mixtures of sodium monosulphite and bisulphite produced inferior pulps of low yields. Monosulphite liquors produced the highest strengths, but low yields. Slash pine heartwood can be pulped with a liquor of high combined sulphur dioxide concentration.

The principal advantages cited for the use of soda instead of lime as the base in sulphite pulping are as follows: Certain woods that are not satisfactorily reducible with lime base liquor can be pulped *(2-11, 16, 18, 22-24, 27-29);* higher yields are obtainable *(14, 26);* quality of pulp is better *(17);* bleach consumption is lower *(12);* color of pulp is better *(7);* cooking is more rapid *(13, 19-21);* liming and pitch troubles are eliminated *(12, 15).* The chief disadvantage in the use of soda has been its greater cost, which thus far has been an effective offset of the advantages and has prevented its extensive use.

The purpose of the experiments herein described was to show any further advantages of the soda arising from the possibility of using liquors of higher combined sulphur dioxide content than are feasible with the lime base. The work consisted of a study of the effects of varying the concentration of combined sulphur dioxide over a wide range to produce pulps of approximately the same bleach requirement in approximately the same time.

Experimental

The wood used for the digestions was white spruce, second-growth western hemlock, and slash pine containing 42 per cent heartwood. Chemical analyses of the spruce wood are given in Table I. All the wood was chipped to lengths of five-eighths of an inch and screened to remove fines. The over-sized chips and knots were removed by hand sorting.

All but one of the digestions were made in a 5-pound capacity autoclave having a stainless-steel lining. The autoclave was steam jacketed to avoid dilution of the liquor. One digestion was made in a 50-pound capacity digester lined with stainless steel. Other conditions, such as the method of heating, and the ratio of liquor to wood, were maintained the same as in the smaller digestions. The equivalent of approximately 10 pounds of 5/8-inch oven-dry chips and 8 gallons of liquor were used for each digestion in the autoclave. The cooking schedule for the white spruce consisted of a linear temperature rise to the maximum, passing through 110 deg. C. at the 2-hour period. A similar schedule was used for the western hemlock and slash pine, except that the temperature was held at 110 degrees for 30 minutes. The maximum temperature was so chosen as to produce pulps of nearly constant bleach requirement in 9 to 12 hours. The pressure was not relieved during the digestion except when necessary to draw off liquor samples. At the completion of the digestion the pressure was relieved and the pulp removed and thoroughly washed, screened in a small diaphragm screen through a plate having slots 0.012 inch in width, the excess water removed by pressing, and the pulp weighted. A representative sample was then taken for the determination of dryness. The yield was calculated and expressed as a percentage of the weight of the oven-dry wood. The screenings were dried and weighed, and their percentages calculated on the basis of the wood.

TABLE I—ANALYSES OF SPRUCE WOOD USED IN EXPERIMENTS

Composition	Shipment Number 1394	
	Per cent	Per cent
Lignin	30.9	27.8
Cross and Bevan cellulose	61.1	60.6
Alpha cellulose	43.0	42.1
Pentosans in cellulose	9.3	...
Total pentosans	11.5	12.1
1 per cent NaOH solubility	12.2	10.7
Hot water solubility	3.2	2.1
Alcohol benzene solubility	1.8	2.3
Ether solubility	0.8	1.1

The soda base liquor was prepared by dissolving caustic soda in water and passing in sulphur dioxide gas to bring the combined and total sulphur dioxide content to the required concentrations.

Results and Discussion

Table II presents the data on white spruce pulps prepared from liquors containing approximately 6 per cent total sulphur dioxide, the combined increasing from 1.26 to a total of 5.98 per cent. The bleach requirement of the pulps ranged between 21 and 26 per cent, and the cooking time between 9 and 13 hours. In order to produce pulps of comparable bleach requirement it was necessary to increase the temperature from 127 to 180 deg. C. as the combined sulphur dioxide was increased in the range specified. Table III presents similar data for western hemlock pulps having somewhat lower bleach requirements.

The total yield of pulps obtained with increasing amounts of combined sulphur dioxide are shown graphically in Fig. 1. For white spruce the yield passed through a maximum when the combined sulphur dioxide was between 2 and 3 per cent. A decided minimum was obtained with 5 per cent. Although the yield obtained with 6 per cent combined sulphur dioxide was higher than that for 5 per cent, it was lower than that obtained with the low combined liquors. Similar trends were obtained from western hemlock, except that the difference in the yield

* To be presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Waldorf-Astoria Hotel, New York, N. Y., Feb. 22-25, 1937.

[1] Member TAPPI, Engineer, Forest Products Laboratory (maintained at Madison, Wis., in cooperation with the University of Wisconsin), Forest Service, U. S. Dept. of Agriculture.

[2] Member TAPPI, Asst. Chemist, Forest Products Laboratory.

obtained was 2 to 3 per cent and with lower percentages of combined sulphur dioxide was less evident.

The difficulty in obtaining a high degree of delignification with sodium monosulphite has been pointed out by Rawling and Staidl *(25)*. They report that when the lignin is to be reduced to 7 per cent or less, the high temperatures necessary result in excessive hydrolysis of the cellulose. Aronovsky and Gortner *(1)* report similar data. It was observed in the present study that the decrease in yield with a lowering of the bleach requirement at the higher concentrations of combined sulphur dioxide was considerably greater than the decrease obtained with the lower concentrations. It is apparent, then, that, although it may be possible to obtain high yields of pulp in a high bleaching range under these conditions, with liquors in the neutral range low bleaching pulps are obtained with a sacrifice in yield.

The tendency toward high screenings, in the case of the spruce, as the combined sulphur dioxide was increased is believed due mainly to somewhat slower penetration of the liquor as the free sulphur dioxide is decreased. The cooking schedule used in the digestions of spruce did not allow any time at 110 deg. C. for penetration. The schedule used in the digestions of western hemlock allowed an extra half hour at 110 deg. C., so that very low screenings resulted. The digestion of western hemlock with monosulphite liquor containing bicarbonate, No. 171, however, gave high screenings, 6.2 per cent, the burned centers indicating insufficient penetration of the liquor. A slower rate of temperature increase or a longer time at 110 degrees would undoubtedly reduce the screenings to more satisfactory values.

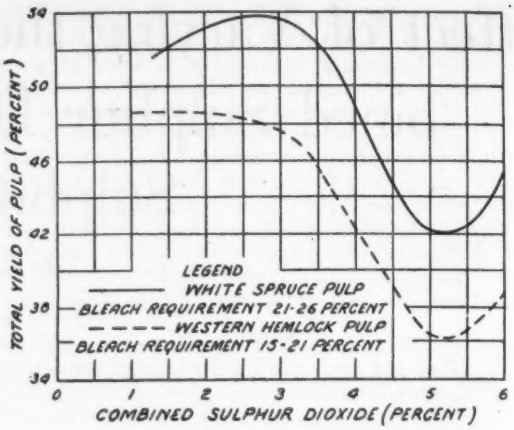


FIG. 1.

Yield of pulp with varying combined sulphur dioxide concentrations.

The maximum bursting and tearing strengths of the pulp obtained with increasing combined sulphur dioxide are shown graphically in Fig. 2. As in the case of the yield, the strengths passed through maximum values at

TABLE II.—CONDITIONS AND RESULTS OF DIGESTIONS OF WHITE SPRUCE

Digestion No.	Liquor: Combined SO_2 (Per cent)	Liquor: Total SO_2 (Per cent)	Liquor: Amount, Gals.	Maximum temperature, Deg. C.	Total time, Hours	Maximum pressure, Pounds /sq. in.	Wood: Weight oven-dry, Pounds	Wood: Dryness, Per cent	Wood: Shipment No.	Yield: Total (Per cent)	Yield: Screened (Per cent)	Yield: Screenings (Per cent)	Bleach used, Per cent	Color: Red (Ives Parts)	Color: Green (Ives Parts)	Color: Blue (Ives Parts)	Bleach requirement, Per cent
S-76	1.26	6.09	8	127	9	85	10.1	91.8	1394	52.4	51.6	0.8	0	76	68	62	24
													21	86	84	81	
S-91	1.48	5.78	8	129	11.5	96	10.2	92.8	1423	51.8	51.3	.5	0	76	71	63	22
													21	88	85	84	
S-86	1.46	5.96	8	129	9	100	10.25	93.2	1423	52.1	51.0	1.1	0	75	67	64	26
													24	89	86	82	
S-75	2.02	6.02	8	132	12	82	10.1	91.8	1394	53.0	52.4	.6	0	73	67	61	21
													21	91	88	85	
S-67	1.96	6.02	8	135	9.25	82	10.1	91.8	1394	53.3	52.4	.9	0	74	65	62	26
													24	87	85	82	
3629-I	2.98	5.96	72	148	12.25	110	90.1	87.3	1423	54.5	52.4	2.1	0	80	68	63	21
													21	90	88	85	
S-62	2.98	5.90	8	152	10	120	10.1	91.3	1394	49.0	46.3	2.7	0	65	58	52	23
													21	87	85	83	
S-66	2.96	5.84	8	148	12.5	75	10.1	91.6	1394	53.2	52.6	.6	0	72	64	60	24
													21	85	84	82	
S-64	3.93	5.88	8	175	13	185	10.1	91.8	1394	49.4	42.7	6.7	0	75	68	61	24
													21	89	84	81	
S-69	3.94	5.94	8	175	13	180	10.1	91.8	1394	48.5	44.8	3.7	0	72	62	58	24
													21	85	83	81	
S-60	3.94	6.05	8	175	12	178	10.47	91.0	1394	50.1	49.6	.5	0	71	63	56	26
													24	85	84	82	
S-99	5.00	6.00	8	180	12.75	145	9.85	89.6	1423	42.2	38.0	4.2	0	75	68	62	26
													25	88	86	84	
S-65	5.98	5.98	8	180	11.5	125	10.1	91.8	1394	45.5	45.1	.4	0	67	59	53	24
													21	88	85	82	

Digestion No.	Pebble mill strength tests of pulp—25x40—500: Bursting strength after milling, Points per pound per ream: 0 min.	20 min.	40 min.	60 min.	80 min.	100 min.	120 min	Tearing strength after milling, Grams per pound per ream: 0 min.	20 min.	40 min.	60 min.	80 min.	100 min.	120 min.	Chemical analysis of pulp: Lignin (Per cent)	Cellulose: Total (Per cent)	Cellulose: Alpha (Per cent)	Pentosans in cellulose	Viscosity, Centipoises	Copper number, Grams/100 g.
S-76	0.45	0.83	1.07	1.14	1.15	1.13	...	1.52	1.35	1.31	1.10	0.94	0.77	...	0.9	95.0	86.0	5.3	109.7	2.4
S-91	.50	.69	.95	1.03	1.03	...	...	1.68	1.62	1.25	1.27	1.12	...	...	.9	94.5	85.6	5.7	71.0	..
S-86	.49	.74	.88	.95	.91	...	...	1.53	1.26	1.15	1.06	.93	...	...	2.1	93.8	86.2	5.6	77.0	2.4
S-75	.48	.78	1.06	1.14	1.12	...	...	1.80	1.84	1.46	1.25	1.16	...	...	.9	96.5	87.0	6.0	57.8	2.2
S-67	.55	.92	1.07	1.15	1.05	...	...	1.78	1.68	1.19	1.12	1.17	...	...	2.4	94.3	86.2	5.4	66.5	2.3
3629-I	.58	.72	.76	.84	.88	.86	...	1.33	1.20	1.29	1.04	1.07	1.02	...	...	...	...	...	...	..
S-62	.39	.67	.89	.94	.90	...	...	1.44	1.56	1.42	1.37	1.15	...	...	.8	94.8	86.2	6.7	21.9	1.8
S-66	.63	.91	1.00	1.05	1.01	...	...	1.93	1.64	1.35	1.28	1.24	...	...	2.1	94.4	85.6	8.1	25.6	2.3
S-64	.45	.56	.60	.62	...	...	...	1.02	.75	.51	.30	...	...	...	1.6	93.2	73.0	8.1	3.4	2.1
S-69	.50	.63	.59	.63	...	...	...	1.34	.77	.55	.56	...	...	...	2.2	93.6	71.7	6.6	4.0	2.1
S-60	.46	.67	.63	...	...	...	...	1.30	.97	.79	...	...	...	...	1.7	93.4	73.2	7.0	...	2.4
S-99	.58	.68	.68	.64	...	...	...	1.25	1.05	1.12	1.00	...	...	...	.5	93.7	71.5	8.6	9.0	1.2
S-65	.63	1.05	1.19	1.30	1.22	1.25	1.17	2.67	2.22	1.99	1.64	1.52	1.25	1.13	2.0	94.8	83.9	10.6	9.9	1.6

combined sulphur dioxide concentrations between 2 and 3 per cent, and dropped to a minimum near 5 per cent. In contrast to the trend of the yield, the strength increased toward a higher maximum at 6 per cent, improvement in the tearing strength being patricularly noticeable at 6 per cent.

Increasing the combined sulphur dioxide concentration had little effect on the total cellulose, the lignin, or the pentosans in the cellulose. The alpha cellulose of those pulps digested in the bisulphite to monosulphite range, however, was very low but returned nearly to normal values at 6 per cent combined. The viscosity fell rapidly with increasing combined sulphur dioxide to a very low value at 4 per cent. Although the viscosity increased slightly as the ratio of monosulphite to bisulphite increased, it was comparatively low, even with the monosulphite alone. The copper number was lowered slightly over the entire range.

In order to determine the effectiveness of the soda base liquors in reducing southern pine heartwood, digestions were made on slash pine containing 6, 3, and 1.2 per cent combined and 6 per cent total sulphur dioxide, and a monosulphite liquor containing sodium bicarbonate. The results are presented in Table IV. Although the soda base liquors containing low percentages of combined sulphur dioxide show some improvement over lime base liquors of similar composition under normal pulping conditions, the high combined liquors appear to be much more effective in this respect.

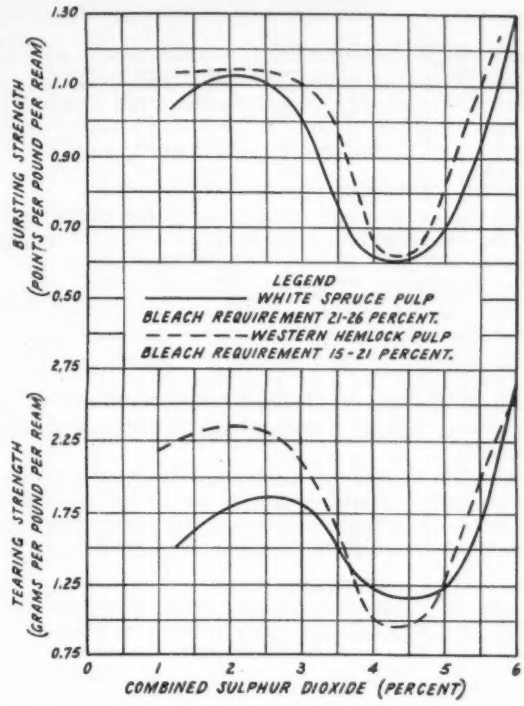


FIG. 2.
Variation of maximum strengths of pulps with varying combined sulphur dioxide concentrations.

Conclusions

The yields and strength properties of pulps that have been digested to approximately the same degree with liquors of progressively greater combined sulphur dioxide concentrations passed through a maximum at 2 to 3 per cent combined sulphur dioxide when the initial total sulphur dioxide was constant at 6 per cent. A minimum occurred at 4 to 5 per cent. The yield increased slightly again at 6 per cent and the strength, especially the resistance to tear, increased to the highest value.

Mixtures of bisulphite and monosulphite produced pulps

TABLE III.—CONDITIONS AND RESULTS OF DIGESTIONS OF WESTERN HEMLOCK

	Liquor			Maximum temperature,		Wood			Yield			Bleach used,	Color			Bleach requirement,
Digestion No.	Combined SO_2	Total SO_2	Amount, Gals.		Total time, Hours	Maximum pressure, Pounds /sq. in.	Weight oven-dry, Pounds	Dryness, Per cent	Shipment No.	Total	Screened	Screenings	Per cent	Red	Green	Blue	Per cent
	Per cent			Deg. C.						Per cent				Ives Parts			
169	0.90	6.00	8	122	10	83	10.68	79.55	1465	49.2	49.1	0.1	0	55	44	39	21
													21	89	88	85	
168	1.18	6.00	8	126	10	86	10.57	79.08	1465	48.7	48.6	.1	0	57	46	41	21
													21	89	88	85	
167	1.46	5.68	8	132	9.87	88	10.69	79.35	1465	48.1	48.0	.1	0	59	48	44	18
													18	89	88	85	
170	2.18	6.00	8	140	9.75	95	10.77	79.95	1465	48.0	47.8	.2	0	64	52	48	19
													18	89	87	84	
162	2.98	6.00	8	155	10	134	10.31	76.80	1465	49.4	49.3	.1	0	73	66	61	17
													18	90	88	86	
173	4.00	6.00	8	183	10.37	184	10.71	80.23	1465	42.4	42.3	.1	0	63	52	46	17
													18	90	88	86	
172	5.00	6.00	8	186	10.37	190	10.91	81.63	1465	36.3	35.4	.9	0	68	59	52	19
													18	90	88	84	
165	5.74	5.74	8	188	10.87	150	11.12	82.42	1465	38.8	38.7	.1	0	75	63	57	15
													15	90	88	85	
171	[1] 5.70	5.70	8	186	11.25	180	10.43	80.25	1465	36.7	30.5	6.2	0	66	55	51	17
													18	90	90	87	

	Pebble mill strength tests of pulp—25x40—500																			
	Bursting strength after milling							Tearing strength after milling							Freeness after milling					
Digestion No.	0 min.	20 min.	40 min.	60 min.	80 min.	100 min.	120 min	0 min.	20 min.	40 min.	60 min.	80 min.	100 min.	120 min.	0 min.	20 min.	40 min.	60 min.	80 min.	100 min.	120 min.
	Points per pound per ream							Grams per pound per ream							Cc. (S.—R.)						
169	0.45	1.00	1.16	1.23	1.18	1.17	...	2.22	1.78	1.46	1.38	1.34	1.24	...	860	820	710	585	435	300	...
168	.53	.84	1.06	1.15	1.14	1.13	...	2.18	2.03	1.77	1.48	1.33	1.30	...	875	855	790	675	555	370	...
167	.42	.75	1.04	1.06	1.13	1.05	...	1.91	1.89	1.66	1.70	1.42	1.40	...	870	860	800	695	490	440	...
170	.43	.73	1.01	1.06	1.04	1.05	1.10	2.33	2.07	1.82	1.75	1.58	1.33	1.35	860	855	815	780	745	455	330
162	.40	.69	.95	1.04	1.00	1.11	...	2.10	2.15	1.74	1.81	1.55	1.47	...	875	865	835	765	755	485	...
173	.51	.62	.66	...	...	...	...	1.03	.76	.57	...	...	...	...	850	810	345	...	...	...	...
172	.67	.78	.79	.83	.82	...	...	1.26	1.20	.97	.86	.69	...	...	850	830	775	680	190	...	...
165	.59	...	...	...	1.06	1.22	1.21	2.31	...	...	...	1.67	1.21	1.07	860	...	...	...	835	725	565
171	.50	.88	.89	.96	1.03	...	1.11	2.81	2.73	2.50	2.35	2.18	...	1.85	850	840	825	835	820	...	800

[1] Neutral sulphite liquor. Sodium carbonate (as bicarbonate) added in the amount of 25 per cent of the weight of the monosulphite.

TABLE IV.—CONDITIONS AND RESULTS OF DIGESTIONS OF SLASH PINE CONTAINING 42 PER CENT HEARTWOOD

Digestion No.	Liquor: Combined SO_2 (Per cent)	Liquor: Total SO_2 (Per cent)	Liquor: Amount, Gals.	Maximum temperature, Deg. C.	Total time, Hours	Maximum pressure, Pounds /sq. in.	Wood: Weight oven-dry, Pounds	Wood: Dryness, Per cent	Wood: Shipment No.	Yield: Total (Per cent)	Yield: Screened (Per cent)	Yield: Screenings (Per cent)	Bleach used, Per cent	Color: Red (Ives Parts)	Color: Green (Ives Parts)	Color: Blue (Ives Parts)	Bleach requirement, Per cent
177	1.20	6.00	8	126	10	76	11.28	64.40	1469	63.0	33.3	29.7	..	..	..	..	..
176	3.00	6.00	8	155	10	118	10.99	61.55	1469	60.2	38.6	21.6	..	..	..	..	..
174	6.00	6.00	8	188	10.62	155	12.89	61.57	1469	37.7	37.2	.5	0	66	57	49	22
													21	89	86	84	
175	[1] 6.00	6.00	8	186	11.25	163	11.05	61.85	1469	38.3	36.1	2.2	0	70	59	52	20
													21	90	88	86	

Pebble mill strength tests of pulp—25x40—500

Digestion No.	Bursting strength after milling: 0 min.	20 min.	40 min.	60 min.	80 min.	100 min. (Points per pound per ream)	Tearing strength after milling: 0 min.	20 min.	40 min.	60 min.	80 min.	100 min. (Grams per pound per ream)	Freeness after milling: 0 min.	20 min.	40 min.	60 min.	80 min.	100 min. (Cc. (S.—R.))
177	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
176	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
174	0.35	0.70	0.83	1.06	1.04	1.04	2.51	2.56	2.24	1.80	1.57	1.46	885	870	855	585	370	215
175	.25	.54	.80	.98	1.07	1.05	1.78	2.87	2.71	2.33	2.10	2.16	890	880	860	770	625	475

[1] Neutral sulphite liquor. Sodium carbonate (as bicarbonate) added in the amount of 25 per cent of the weight of the monosulphite.

of very inferior strength, low alpha-cellulose content, and low viscosity.

Monosulphite liquors produced pulps having the highest strength, especially tearing strength, but of low yield and low viscosity. Slash pine heartwood was reduced to pulp by the use of monosulphite liquor.

Literature Cited

(1) Aronovsky and Gortner. *Ind. Eng. Chem.* 25, No. 12, 1349-54 (1933).
(2) Bradley and McKeefe. D. R. P. 375,053 (1923).
(3) Bradley and McKeefe. Brit. Pat. 150,434.
(4) Bradley and McKeefe. Can. Pat. 219,557 (1922).
(5) Braun. D. R. P. 283,290.
(6) Braun. D. R. P. 151,285 (1902).
(7) Brot and Hirschel. *Papier* 29, 75-80 (1926).
(8) Brown. D. R. P. 309,181.
(9) Brown. D. R. P. 400,858.
(10) Brown. D. R. P. 397,927.
(11) Cable. "Chemistry of the Sulphite Process," Miller, Swanson, et al. Lockwood Trade Journal Company, New York.
(12) Clifford. *Paper Ind.* 3, No. 9, 1247-8 (1921).
(13) Cross. "Cellulose", by Cross and Bevan. Lond. 1910, pp. 209, 210.
(14) Cross and Englestad. *Jour Soc. Chem. Ind.* 44, 270T (1925).
(15) Dorenfeld. *Pulp and Paper Mag. Can.* 28, No. 9, 320 (1929).
(16) Drewson. U. S. Pat. 1,229,422 (1917).
(17) Ekman. "Handbuch der Papierfabr." by Hoffman, p. 1511 (1897).
(18) Haglund, G. *Pacific Pulp and Paper Ind.* 8, No. 7, 5-6 (1934).
(19) Masurawa. Jap. Pat. 31,914 (1917).
(20) Masurawa. U. S. Pat. 1,244,525 (1897).
(21) Masurawa. *C. A.* 12, 2249.
(22) McKee and Cable. *Papier Trade J.* 80 (17), 41-6 (1925).
(23) Müller and Heigis. D. R. P. 284,681.
(24) Müller and Heigis. Brit. Pat. 156,512.
(25) Rawling and Staidl. *Paper Trade J.* 8, 49 (1925).
(26) Richter and Schur. U. S. Pat. 1,780,943 (1930).
(27) Schacht. D. R. P. 122,171 (1900).
(28) Schacht. D. R. P. 131,118.
(29) Schalz, Posanner and von Halle. D. R. P. 325,918.

Some Causes for Non-Uniformity in Sulphite Pulp Manufacture*

By O. E. Anderson[1]

Abstract

The 1 per cent caustic soda solubility test affords a reliable, convenient check on wood quality. Its relationship to such factors as tear resistance and yield, is shown, both of which decrease with increasing caustic solubility. Variation in pulp quality as a result of mixing species of wood in the digester, is found to vary, the wood of higher lignin content producing pulp of higher lignin content. Various types of penetration curves in cooking are shown, the penetration at higher temperatures (below the critical point) giving pulp of higher alpha cellulose content.

While there are many variables affecting pulp quality and yield, the effects of some are rather obvious, while other variables lend themselves quite well to experimental evaluation. Many of these factors have been evaluated with a commendable degree of precision and thoroughness and presented before the Technical Association by such organizations as the U. S. Forest Products Laboratory, and the Institute of Paper Chemistry.

There are some variables peculiar to commercial operation, which can best be determined in connection with commercial equipment. This paper deals with some of these variables.

* To be presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Waldorf-Astoria Hotel, New York, N. Y., Feb. 22-25, 1937.

[1] Member TAPPI, Sulphite Supt., International Paper Company, Chisholm, Maine.

Wood Quality

The 1 per cent caustic soda solubility test has been shown to be a reliable test for relative soundness of wood. To study the effect of wood quality on pulp quality and yield sample sticks of wood from various sources were selected, chipped separately, and screened. The samples to be cooked, containing a known weight of wood, were suspended in a basket from the top of the commercial digester so as to be well below the lowest liquor line. This basket was perforated and lined with fine wire to prevent fibers from entering or leaving the basket, and was fitted with a partition so that two samples of wood could be compared at a time. After blowing the digester the basket was withdrawn and its contests analyzed. Representative samples of chips were disintegrated for tests for caustic solubility and lignin content. It is evident that the usual variations in cooking, acid concentration, etc. were present, and only variables having considerable effect would be likely to show up. The results of this series of tests are shown in Table I.

In Table I the yield is corrected for lignin content of pulp. The bursting and tearing strength are on unbeaten pulp.

Caustic Soda Solubility vs. Tear and Yield

The tear and yield follow the caustic soda solubility as shown in Fig. 1. The tear is higher for the spruce, probably due to a difference in fiber length. The yield, how-

TABLE I

Sample No.	Kindof Wood	Roe Chlorine No.	Bursting Strength, Points per pound per ream	Tear Strength, Grams per pound per ream	Total Yield, Per cent	Rings per inch diameter	1 Per cent Caus. Sol.	Per cent Lignin
1	Sound spruce from Winn, Me.	3.80	.38	1.80	53.5	18.4	13.84	27.00
2	Sound fir from Winn, Me.	5.04	.37	1.60	44.0	10.4	14.12	29.75
3	Gaspe spruce 2 years in pile	3.26	.58	1.64	45.7	14.6	15.78	27.68
4	Gaspe fir 2 years in pile	4.12	.63	1.47	51.5	12.7	14.17	30.72
5	Sound spruce from Winn, Me.	2.33	.42	2.08	53.5	18.4	13.84	27.00
6	Fir from pile	3.36	.53	1.90	42.6	10.0	13.35	30.95
7	Pile spruce (considerable heart rot)	4.36	.48	1.37	41.7	24.4	24.96	31.82
8	Pile fir (some heart rot)	4.93	.76	1.45	44.7	17.5	15.94	32.10

ever, seems more dependant on soundness of wood than on species. The bursting strength does not follow consistently either caustic soda solubility or species. As you will note from Table 1, the bursting strength does not follow the rate of growth either. Possibly the answer is that the ratio of spring wood to summer wood causes the greater variation in bursting strength. We have consistently found a higher bursting strength on such woods as spruce and fir from Gaspe and Vermont. Effect of variation due to different ratios of spring and summer wood has been shown by Curran. (1)

Mixing Species of Wood

In each experimental pot, a sample of spruce and a sample of fir were cooked simultaneously, separated by a perforated partition. It is to be noted in Table I that in every case the Roe chlorine number of the pulp was considerably lower with spruce than with fir. In view of the fact the Roe chlorine number is a measure of the lignin content it is to be expected that, given the same treatment, the wood of higher lignin content should give pulp of higher lignin content. Samples 7 and 8, which are most nearly alike with respect to lignin are also most nearly alike with respect to the Roe chlorine number. These tests illustrate the variation which can occur as a result of mixing different species of wood. With such a wide difference with spruce and fir, the difference could be expected to be much greater with spruce and hemlock, for instance. In commercial practice we see only the composite, unmindful of the wide difference in character of the component parts. Especially with higher average chlorine number, the wood of higher lignin content tends to produce hard, shivy pulp.

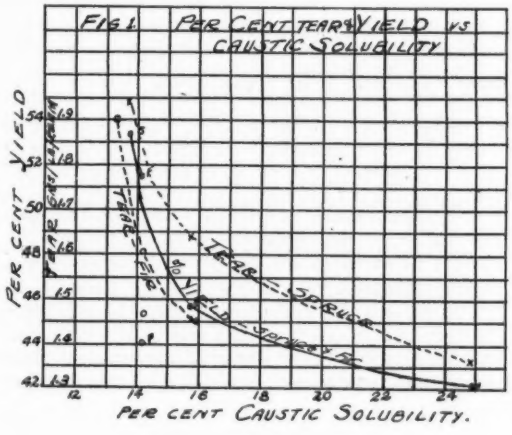


FIG. 1.
Per cent tear and yield vs. caustic solubility.

Caustic Soda Solubility vs. Bursting Strength

While it is to be expected that with a uniform source of wood the bursting strength would increase with a decrease in caustic solubility, it often is obscured by other variables. By taking a large enough number of tests, representing individual cooks, and using wood out of a pile which has the species sufficiently mixed that the proportion of species changed little on weekly averages, we can compare caustic solubility on wood with bursting strength on resulting pulp. Table II shows this relationship on weekly averages of commercial cooks.

TABLE II

	Caustic Soda Solubility	Bursting Strength, Points per pound per ream
Average of 12 weeks.....	14.05	.47
Average of 20 weeks.....	14.81	.43
Average of 8 weeks.....	16.03	.40

In Table II, average strength for weeks in which the caustic soda solubility ranged between 13.5 and 14.5 were included in the first line, 14.50 to 15.50 in the second line, and above 15.50 in the third line.

Changes in bursting strength and tear strength often can be traced to variation in soundness of wood. When this variation is great it can be noticed by visual inspection. However, with the caustic solubility test, lesser variations in soundness can be revealed and can be recorded in numerical form.

While data correlating caustic soda solubility and soundness appeared in technical literature, many years ago, many mills are not taking full advantage of its possibilities in helping to account for variations in pulp quality in commercial practice.

Ratio of Combined SO_2 To Wood

The effect of a shortage of combined SO_2 on such pulp characteristics as strength, color, cleanliness and shive content are too well known for repetition here. Each mill determines the minimum per cent of combined SO_2 that can be used under normal operating conditions, and plans to carry a safe margin above the minimum requirements. The actual pounds of combined SO_2 per ton of dry wood is affected primarily by three factors: 1. The per cent of SO_2 in acid; 2. Volume of acid and, 3. Dry weight of wood.

The concentration of acid is usually watched very closely, but often the other two factors are overlooked on the assumption that they are fairly constant. Such might not be the case. We have found cases where without forced packing of chips, an increase in tons dry wood per digester from 18.1 to 21.8 as a result of moisture content increasing from 29.1 to 40.1 per cent. These are based on two full months operation, the chips having been weighed over a chip weightometer. Obviously, with an increase of 20 per cent in wood volume, there would be a corresponding decrease in acid volume with a decided decrease in pounds combined SO_2 per ton of wood, unless properly compensated for in acid concentration. This condition might be the source of considerable variation in pulp quality particularly where chip packing or distributing devices are used without sufficient control to assure uniform filling. By way of illustration a case is known where two mills using wood of similar type and obtaining approximately same yield, one mill was using 0.95 per cent combined SO_2, with a limestone consumption of 275

pounds per ton, and the other mill was using 0.75 per cent combined with a limestone consumption of 330. It is evident then, that without sufficient control of acid volume to wood ratio what may constitute a minimum combined SO_2 content in one case may represent a decided excess in another.

This excess may cause precipitation of monosulphite in the digester, and cause irregularity due to "liming" of the steam line, or digester not discharging contents completely.

Digester Hang-Ups

As suggested in the previous paragraph, "liming" over the blow-off valve may cause a "hang-up" in the digester. In many cases this "hang-up" may be caused by part of the cook not cooking completely due to lack of proper circulation. That the circulation and penetration can be improved by increasing the per cent free SO_2 in the acid has been the experience of several mills. The relationship between the per cent of "hang-ups" and acid concentration is shown in Fig. 2.

The statistics represented in Fig. 2 are based on observations of 2500 cooks over a period of one and one half years. All cooks were placed in four groups according to acid concentration. The groups, based on per cent total SO_2 were as follows: 4.00 to 4.30 per cent, 4.31 to 4.60 per cent, 4.61 to 4.90 per cent, and 4.91 per cent and above.

If digesters which have failed to blow clean are not washed out or reblown, it is evident that considerable variation can occur due to the character of the stock which is recooked, and to a change in acid-wood ratio due to putting in less chips.

Penetration

A very noticeable drop in tons of chips per digester is noted with an increase in per cent hang-ups.

The influence of acid concentration and temperature on penetration has been studied with a commendable degree of precision and thoroughness by McGovern. These tests were done under closely controlled conditions with an experimental digester. In order to study this problem from a commercial angle, a small experimental digester of three gallon capacity was set up so as to draw liquor directly from a commercial digester, and relieve out of the top. Thus the small digester had similar conditions to the large digester with respect to acid concentration changes during the cook as well as pressure. The large

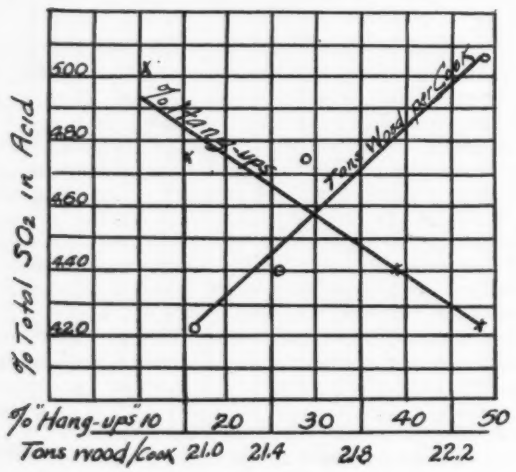


FIG. 2.
Per cent SO_2 vs. per cent Hang-ups.

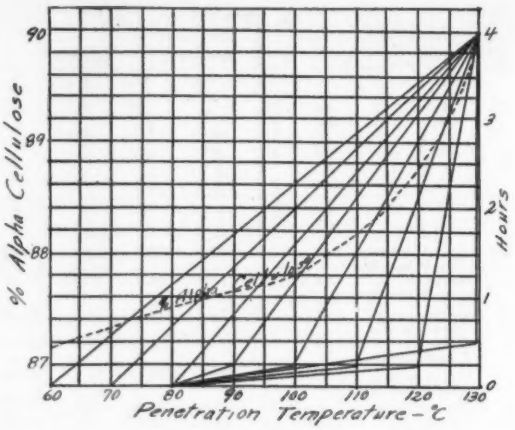


FIG. 3.
Penetration vs. alpha cellulose.

digesters use hot acid, with forced circulation back to an acid accumulator previous to steaming. This was considered an aid in securing uniform acid concentration and temperature when steaming was begun.

A large enough batch of commercial chips was screened and thoroughly mixed, to supply all cooks so as to eliminate wood variables. The wood charge was weighed, as was also the pulp. Four hours to 130 degrees C. was used as standard except where penetration at 130 degrees C. was studied in which case 30 minutes time was allowed to bring temperature to 130 deg. C. Following this, the temperature was allowed to rise to a maximum of approximately 140 deg. C., a slightly lower maximum being used where penetration was at higher average temperature so as to have an eight hour cook. An auxiliary steam coil was used in the small digester where it was necessary to have a higher temperature than the incoming liquor from the large digester. The penetration curves are shown in Fig. 3. It is to be expected that a certain amount of variation in acid strength, relief, temperature, etc. would occur from cook to cook, which would affect pulp characteristics.

The bursting strength, tear, and yield were found to vary from cook to cook to an extent which could be expected with the existing variations. It could not be said that there was any consistent variation with changes in penetration temperature.

It was remarkable, however, that in spite of these variables, a consistent increase in alpha cellulose content of the pulp was found at higher penetration temperatures. This is shown by the dotted line in Fig. 3. Whether these benefits can be obtained in commercial operation will depend on the uniformity within the large digester.

An attempt was made to step up the temperature to 130 deg. C. in less than 30 minutes, but this resulted in incomplete penetration as evidenced by brown-centered chips.

These experimental results in penetration seem to check fairly well with the observations of McGovern (2) as to the effect of temperature on penetration and particularly as to the critical point.

While we can not expect the degree of accuracy in this work than one would find on a strictly experimental basis, in practice, we often ask ourselves as to what extent such experimental results are applicable to commercial conditions.

Literature Cited

(1) Curran, C. E. *Paper Trade J.* 103, No. 11:36-40 (Sept. 10, 1936).
(2) McGovern, J. N. *Paper Trade J.* 103, No. 20:29-42 (Nov. 12, 1936).

Heat Balance Calculation on Sulphate Recovery System*

By W. T. Webster[1]

The following calculation is for a spray type unit with waste heat boiler, superheater, air preheater and water walls. A similar calculation may be made for operation of any other type of unit.

This calculation is based on one ton of pulp. The black liquor from one ton of pulp was found to contain 2750 lbs. of solids. Analysis of the black liquor showed a calorific value for the solids of 6560 B.t.u. per lb. of solids. Black liquor solids contained 63.9 per cent organic material and 36.10 per cent inorganic material. Black liquor as introduced into the furnace contained 35 per cent water and was at a temperature of 212 deg. F.

Heat Input to Furnace

Heat in solids—2750 lbs. solids per ton × 6560 B.t.u. per lb. = 18,040,000 B.t.u.

Sensible heat water content (4230 lbs. liquor—2750 lbs. solids = 1480 lbs. water)

1480 lbs. water × (212 deg.—70 deg.) = 210,160 B.t.u.

18,040,000 + 210,160 = 18,250,160 B.t.u. gross input to furnace.

NOTE—(Sensible heat in solid content of liquor is ignored in this calculation.)

Heat Distribution

1. Flue Gas

2750 lbs. solids × 6390 = 1757 lbs. organic material in liquor from a ton of pulp.

From ultimate analysis of the solids and the flue gas analysis given below under Item 5, the weight of dry flue gas per lb. of organic material is calculated to be 8.64 lbs.

Thus: 1757 × 8.64 lbs. gas per lb. organic = 15,180 lbs. flue gas.

Note: If actual weight of flue gas is known, it should be used in the following calculation.

Temperature of flue gas leaving air preheater is 500 deg. F. Room temperature is taken as 70 deg. F.

Then—15,180 × (500 deg.—70 deg.) × 25 (specific heat of gas) = 1,631,950 B.t.u.

2. Hydrogen Combustion Loss

Hydrogen content of black liquor solids = 3.0 per cent from ultimate analysis.

Note: If ultimate analysis is not available, 3.0 per cent may be assumed without introducing any serious error.

Then 2750 lbs. solids × .03 = 82.5 lbs. hydrogen.

82.5 × 18 + 2 = 742.5 lbs. water per ton pulp from combustion of hydrogen.

Note: The ratio 18 + 2 is the molecular proportions of hydrogen and oxygen in water.

742.5 × 1090.7 + 0.455 (500 deg. — 212 deg.) = 907,112 B.t.u.

(Above formula from A.S.M.E. Boiler Test Code)

3. Moisture in Air Loss

This is an unimportant item and may be disregarded. However, it may be calculated as follows:

15,180 lbs. air × 0.008 lbs. moisture per lb. air = moisture in air per ton capacity.

121 × 0.455 (500—70) = 23,670 B.t.u.

Note: Temperature exit gases: 500 deg. F. and of air entering preheater 70 deg. F.

4. Loss Due to Moisture in Liquor

Black liquor to furnace contains 35 per cent water, or 1480 lbs. water per ton capacity.

Black liquor to furnace contains 35 per cent water, or 1480 lbs. water per ton capacity.

1480 × 970 + 0.455 (500-212 deg.) = 1,629,480 B.t.u.

Where

Latent heat water = 970 B.t.u.

Specific heat superheated steam = 0.455.

Temperature exit gases = 500 deg. F.

Temperature entering liquor = 212 deg. F.

5. Incomplete Combustion

Analysis of flue gas showed 13.08 per cent CO_2 and × 0.2 per cent CO — from ultimate analysis — 28.9 per cent carbon.

0.2 ÷ (13.08 + 0.2) × 2750 × .289 × 10.160 = 121,640 B.t.u.

6. Fusion of Chemical

2750 lbs. solids × .361 (% inorganic) = 993 lbs. inorganic.

993 inorganic + 300 lbs. salt cake (Na_2SO_4) = 1293 lbs.

1293 × (1750 -212) × .25 specific heat = 497,158 B.t.u.

Where:—Fusion temperature = 1750 LF.

Liquor enters furnace at = 2.2. F.

1293 × 64 B.t.u. per lb. to fuse chemical = 82,752 B.t.u.

Total heat required to heat and fuse chemical in furnace—579,910 B.t.u.

7. Reduction of Salt Cake (Na_2SO_4)

300 lbs. salt cake per ton × 3025 B.t.u. required per lb. salt cake for reduction = 907,500 B.t.u.

Note: This is endothermic reaction.

8. Loss of Carbon Due to Reduction

The reduction of salt cake takes place according to following equation:

$$Na_2SO_4 + 2C = Na_2S + 2CO_2$$
$$142 \quad 24 \quad 78 \quad 88$$

Thus: We see that 24 lbs. of carbon combines with 142 lbs. of sale cake during reduction.

300 × 24 ÷ 142 = 50.7 lbs. carbon must be utilized from organic content of black liquor to carry out reduction.

Therefore 50.7 lbs. × 14,150 B.t.u. per lb. organic = 717,405 B.t.u.

9. Steam Generated

Steam is generated in waste heat boiler at 450 lbs. pressure and 650 deg. F. Feed water temperature is 210 deg. F.

Steam generated — 9318 lbs. per ton.

9318 lbs. × (1330—178) = 10,735,155

* To be presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Waldorf-Astoria Hotel, New York, N. Y., Feb. 22-25, 1937.

[1] Member TAPPI, Superintendent St. Regis Kraft Company, Tacoma, Wash.

This is equivalent to: 11m055 lbs. steam per ton from and at 212 deg. F.

Where:—Heat in steam = 1330 B.t.u.

Heat in feed water = 178 B.t.u.

10

Radiation and unaccounted for loss is equal to 5.6% or, 1,020,000 B.t.u.

Summary

Heat Input to Furnace—18,250,160 B.t.u.

Item	Heat distribution	B.t.u.	Per cent
1	Flue gas loss	1,631,950	8.94
2	Hydrogen combustion loss	907,112	4.95
3	Moisture in air loss	23,670	.13
4	Moisture in liquor	1,629,488	8.92
5	Incomplete combustion loss	121,640	.67
6	Fusion of chemical	579,910	3.17
7	Reduction of salt cake	907,500	4.95
8	Loss from carbon used for reduction	717,405	3.93
9	Steam geenrated	10,735,155	58.74
10	Radiation and unaccounted for	1,020,000	5.60
	Efficiency heat absorbed by boiler and air heater over the total heat input		58.74

Heat is usefully employed to fuse the chemical and reduce the salt cake in addition to that heat absorbed in the boiler and air heater. The overall efficiency of the complete unit may, therefore, be expressed as follows:

Items Nos. 6, 7, 8, 9 = Overall efficiency

Total heat input

Overall efficiency in above example is—70.79 per cent.

Grinding Characteristics of Various Woods*

By R. I. Wynne-Roberts[1]

Abstract

With attention being paid, today, to the economic utilization of various types of deciduous and coniferous woods in the groundwood process, this paper attempts to record the results and observations of a large number of tests recently conducted with a number of these woods.

There are obviously many factors controlling the quality of the pulp produced from wood. Some, such as stone speed and type of burr used, can be independently controlled. Others, such as unit pressure of the wood on the stone and temperature of grinding, can be held to average values; while still other variables as power consumed per ton of pulp and strength-freeness relationship are intrinsic to the specie of wood and to the interaction of the type factors previously mentioned.

The experimental work was carried out on a self-contained installation using a three pocket grinder housing a 54x27 inch stone. Fresh water showers were used on the stone.

Pit stock was washed and diluted with white water to a suitable screening consistency and screened over two primary and one secondary flat screens. The screened stock flowed to a wet press and the pulp was taken off in laps. The white water from the wet press was returned to the system and reused.

Wood was cut to two foot lengths and disc samples secured for density. The wood was weighed and then placed in a half cunit rack. The per cent moisture content of the wood was determined by boring a representative number of the sticks. The end area of the sticks were scaled and the cunit volume calculated.

Yield of screened pulp was determined from the weight of lapped pulp produced. Periodic sampling of the laps provided a measure of the wetness so that an air-dry weight could be calculated.

An operating log was carefully kept noting time interval in grinding and the power consumed so that stone production and unit power consumption could be determined.

All losses from the system were checked and a record kept as to their quantity.

Grinder pit stock was sampled periodically and tested for freeness and strength according to a fully standardized procedure. Strength sheets were prepared at 32 pounds basis weight. Freeness tests were made on a Canadian standard freeness tester.

* To be presented at the Annual Meeting of the Technical Association of the
* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Waldorf-Astoria Hotel, New York, N. Y., Feb. 22-25, 1937.

[1] Member TAPPI, Norton Company, Worcester, Mass.

Relation of Yield to Density

In Table 1 is given the list of the woods experimented with and the corresponding data as to yield of screened stock (a.d.) per cunit and the density expressed as oven-dry weight on green volume.

TABLE I—RELATION OF YIELD TO DENSITY

Kind of Wood	Density	Yield per Cunit
Loblolly pine	.49	3000
Shortleaf pine	.46	2850
Cottonwood	.44	2700
Poplar	.43	2575
Jack pine	.41	2500
Hemlock (Eastern)	.40	2450
Spruce	.38	2375
Balsam	.34	2050

Density: Oven-dry weight on green volume.
Yield: Pounds a.d. screened stock per cunit.

Density of wood to be valuable as an index of the available wood material must be based on a large number of sticks that accurately represent the run of the wood. In the yield tests that were made the amount of wood used was relatively small so that the density figures are open to question. However, the yield of wood is roughly in proportion to the density of the wood as shown in Fig. 1.

The work conducted by Thickens some years ago indi-

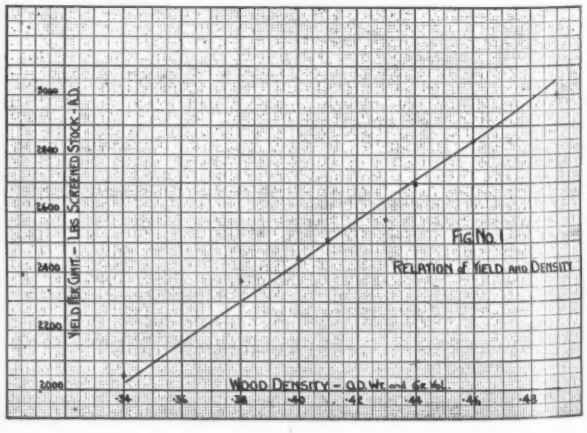


FIG. 1.

cated that there was a relation between yield and density and this data serves merely to confirm the conclusion. The yield is, of course, the total pulp produced regardless of quality. Consideration of yield alone will not determine the economic worth of the wood as quality must be obtained in certain cases only with sacrifice of unit production.

Grinding Characteristics

Mullen strength and freeness of the pulp is usually considered a satisfactory control index of the quality. Of late years other tests have been added, principally screen classification, tear and tensile. These require more time for their completion than is ordinarily available so that they are made on special occasions only.

Assuming that freeness and mullen denote quality then a measure of power consumed per ton and the tonnage produced at this pulp quality will define the grinding characteristics of any wood under equal conditions of unit pressure, pit temperature and burr type.

The plot of a large number of tests relating freeness and mullen for any given wood will show the individual points falling within a band, although the locus of the average curve is regular and definite in trend. The accuracy of the tests was beyond question so that it must be concluded that the condition of deviation from a smooth curve is a point of fact and peculiar to the process of grinding wood. However, if the data is retabulated so that the freenesses are averaged for a strength variation of say five points, then a number of average points are obtained that fall on a smooth curve. The further plotting of the curve on semi-logarithmic paper reduces it to a straight line relationship.

Fig. 2 shows the freeness-strength relation for the woods that were experimented with. The marked superiority of spruce over all other woods is noticeable at once. Balsam, likewise, is shown to be generally superior although falling second best to spruce.

The relative position in the family of curves for the other woods is evident from an inspection of the graph. The slope of the curves are not the same so that apparently the freeness-strength relationship is individual for the various woods. It is not unlikely, however, that further

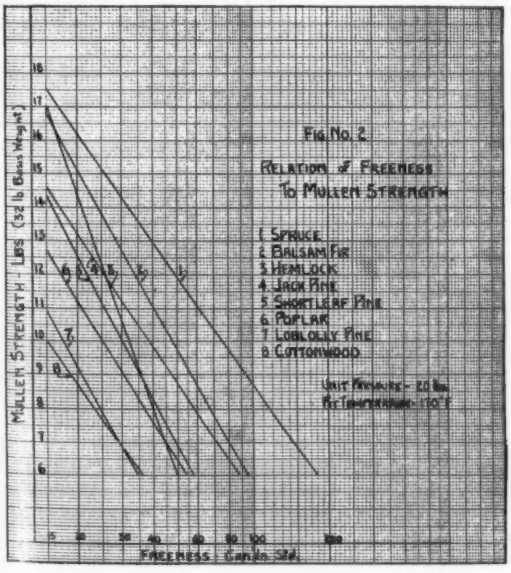


Fig. 2.

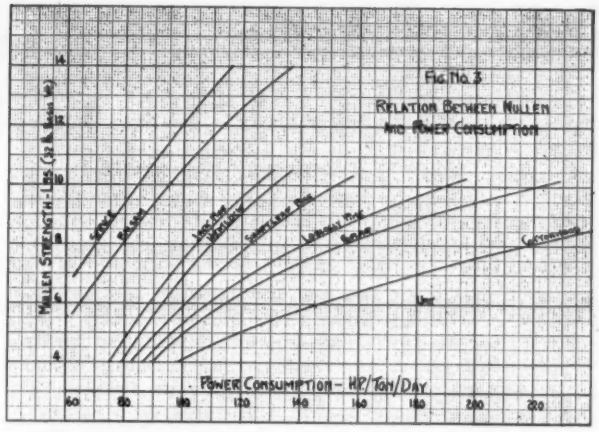


Fig. 3.

extensive tests might establish that the curves really belonged to a family.

The strength-power consumption relationship is shown in Fig. 3 and the strength-production relation in Fig. 4. It will be noted that the curves are more symmetrical than those for the strength-freeness relation. The relative position for the individual woods remains about the same with the exception of poplar which falls between hemlock and shortleaf pine in production and between loblolly pine and cottonwood in power consumption.

TABLE II—GRINDING CHARACTERISTICS OF WOODS AT MULLEN STRENGTH OF 8 POUNDS

Wood	Freeness cc.	Tons per 10 sq. ft. per day	Horsepower per ton per day
Spruce	115	12.0	70
Balsam	68	9.6	80
Hemlock	40	7.4	108
Jack pine	58	8.0	105
Shortleaf pine	42	6.4	125
Poplar	37	6.0	140
Loblolly pine	25	4.8	150
Cottonwood	22	3.2	215

It is evident that regardless of the wood, strength is obtained only by absorbing power and limiting production by adjustment of the grinding surface of the stone. This fact has been known by virtue of practical experience but the numerical evaluation of it is not as widely established. Spruce and balsam are identified as superior woods in the greater production at lower power rates under similar operating conditions.

A strength of 8 pounds mullen (32 pounds basis weight) would be considered on the low side of good operation for spruce and balsam. Assuming that, however, this strength will provide a pulp of passable strength it is interesting to note the freeness values, power rates and production figures for the various woods at this strength. These have been tabulated in Table II.

This tabulation gives a measure of the relative grinding characteristics of the various woods under the specified conditions of operation. From it may be visualized the probable operating economies that may be anticipated from the use of any of these woods. The extent to which a wood could be used would depend upon the necessary regulator freeness and the degree to which production could be sacrificed at the higher power consumption indicated.

If freeness at a constant strength is plotted against production and against power consumption two curves are obtained as shown in Fig. 5. It is evident that as the freeness of pit stock corresponding to a base strength of 8 points drops according to the intrinsic qualities of the wood the production likewise is reduced. The rela-

tion is not linear, the loss in capacity increasing more rapidly than the concomitant freeness.

Similarly the power consumption per ton day rapidly increases as the freeness necessary to maintain a strength of 8 points grows less.

The plot of the freeness, production and power rate at other basic strengths fall within the locus of the curves established in Fig. 5. It may be concluded, then, the production and power rate for any wood at a given strength and under given operating conditions is related to the freeness necessary to maintain the required strength, and is individual for each wood.

The tests were made at a low unit pressure (20 pounds per square inch pocket area) hence the production rates are lower and the power consumption higher than might be expected for higher and more normal pressures. The power consumed per ton of pulp drops quite appreciably with increased pressures hence for purposes of power economy higher pressures than those used during the tests would produce equal quality pulp at lower power consumption.

This is aptly illustrated by further consideration of the two southern woods. The wood contained a fairly high percentage of heartwood and was denser and more difficult to grind than some subsequent shipments used in a commercial test. It has been suggested that high unit pressures are desirable in grinding the Southern species pressures of 45-50 pounds, a strength of 8-9 pounds mullen (32 pounds basis weight) have been obtained with loblolly at a power consumption of from 90-100 h.p. per ton per day, a figure considerably lower than that shown in the tests recorded in this paper.

At higher unit pressures the unit production would likewise be appreciably increased, approximately in proportion to the increased pressure.

Hence the prime value of this data lays in the proof of obviously different grinding characteristics of various woods and in the fact that freeness, strength, production and power consumption are inter-related variables that permit comparative evaluation of woods of given physical and chemical condition under identical operating conditions.

There is no immediate relation that suggests itself relating density or other physical properties of the woods to the freeness that is apparently intrinsic to the specie being ground. This will not necessarily be dependent upon the length of the fiber in the wood but rather upon both this factor and the tenacity of the bond or matrix that binds the fibers together. A measure of this tenaciousness has not yet been made.

If a wood such as shortleaf pine is first subjected to a

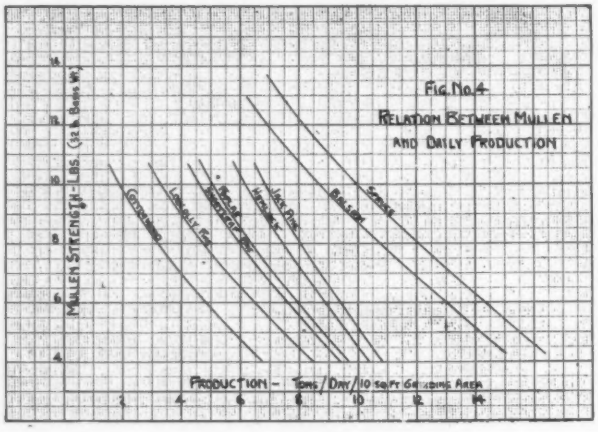


Fig. No. 4
Relation Between Mullen and Daily Production
Mullen Strength - Lbs. (32 lb. Basis Wt.)
Production - Tons / Day / 10 Sq. Ft. Grinding Area
Cottonwood
Balsam
Spruce

Fig. 4.

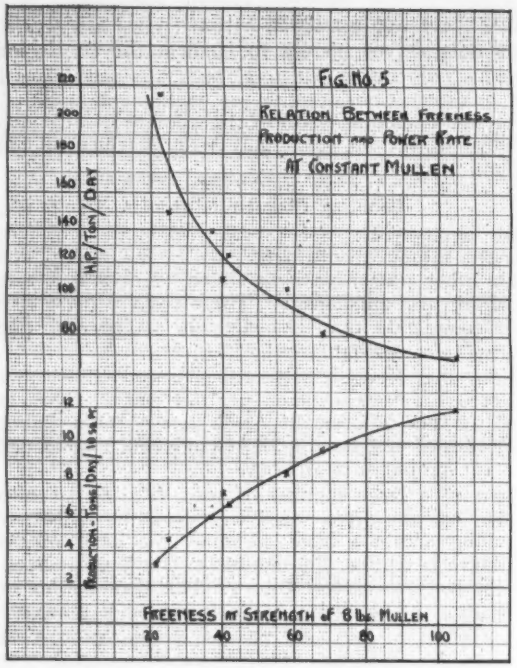


Fig. No. 5
Relation Between Freeness, Production and Power Rate at Constant Mullen
H.P. / Ton / Day
Production - Tons / Day / 10 sq. ft.
Freeness at Strength of 8 lbs. Mullen

Fig. 5.

mild acid cook, keeping the wood in the form of bolts, and subsequently ground, the resultant pulp is extremely long and resembles sulphite. The loosening of the material bonding the fibers together permits the removal of the fiber in the process of grinding without the serious loss in length that is common to the ordinary process. This suggests that the tenacity of the bond may vary between woods so that those possessing an ultimate fiber length about equal, may yield a pulp quite different in average fiber length and in the distribution of fiber size.

Some idea as to the color characteristics of the pulps produced from the woods experimented with may be gauged from the tabulation in Table III.

The brightness was determined by the Institute brightness tester, while the per cent white was measured by the B and L opacimenter using the white body as 100 per cent reflectance.

Cottonwood gives the brightest pulp somewhat whiter than balsam fir. Jack pine gave the dullest pulp and the poorest color.

It must be remembered that the data given in this paper applies specifically to the woods used and under the stated conditions. There is no question that depending upon the exact nature of the wood in respect to density and locale, the per cent moisture content, amount of compression wood present and other similar factors, the freeness, production and power rates can and will deviate appreciably from those shown. Furthermore the data as given assumes constant unit pressures, pit temperatures, stone speed and burr type so that the comparative evaluation of the woods is under constant operating conditions and not vitiated by inclusion of these disturbing factors.

TABLE III—COLOR CHARACTERISTICS OF PULPS

Kind of Wood	B. and L. Per cent White [1]	Brightness [2] Per Cent
Cottonwood	85.5	63.0
Balsam	85.0	58.6
Spruce	81.5	56.4
Loblolly pine	81.0	52.3
Shortleaf pine	81.0	53.1
Poplar	81.0	58.3
Hemlock (Eastern)	77.5	52.8
Jack pine	75.0	42.4

[1] B. and L.: Bausch and Lomb opacimeter.
[2] Brightness: Institute reflectance meter.

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING FEBRUARY 6, 1937

CIGARETTE PAPER

De Mauduit Paper Corp., *Paris,* Havre, 1 cs.; Champagne Paper Corp., *Paris,* Havre, 978 cs.

WALL PAPER

———, *Bremen,* Bremen, 3 cs.; S. K. Lonegren, *Gripsholm,* Gothenburg, 20 bxs.

PAPER HANGINGS

W. H. S. Lloyd & Co., *American Farmer,* London, 11 bls.

WALL BOARD

Treetex Corp., *Gripsholm,* Gothenburg, 1,985 bdls.

NEWSPRINT

Jay Madden Corp., *Pr. Harding,* Hamburg, 959 rolls; N. Y. Tribune, *Markland,* Liverpool, N. S., 1,415 rolls; World Telegram, *Markland,* Liverpool, N. S., 594 rolls; N. Y. Evening Journal, *Markland,* Liverpool, N. S., 605 rolls; Brooklyn Daily Eagle, *Markland,* Liverpool, N. S., 462 rolls; Westchester Newspapers, *Markland,* Liverpool, N. S., 46 rolls; Parsons & Whittemore, Inc., *Markland,* Liverpool, N. S., 344 rolls; Lunham & Reeve, Inc., *City of Fairbury,* Kotka, 163 rolls; H. Reeve Angel & Co. Inc., *City of Fairbury,* Kotka, 191 rolls; Jay Madden Corp., *Sagoporack,* Kotka, 250 rolls; Perkins Goodwin & Co., *Hamburg,* Hamburg, 358 rolls; N. Y. Evening Journal, *Washington,* Hamburg, 316 rolls; Jay Madden Corp., *Washington,* Hamburg, 244 rolls.

PRINTING PAPER

Oxford University Press, *Lancastria,* Liverpool, 5 cs.; R. J. Saunders, *Berengaria,* Southampton, 5 cs.; ———, *Washington,* Hamburg, 148 rolls; International F'd'g. Co., *Black Tern,* Antwerp, 5 cs.

PAINTED PAPER

———, *Paris,* Havre, 2 bls.

WRAPPING PAPER

Jay Madden Corp., *Pr. Harding,* Hamburg, 577 rolls; M. M. Cohen, *Pr. Harding,* Hamburg, 288 rolls, 54 bls.; F. C. Strype, *Konigstein,* Antwerp, 2 cs.; H. Reeve Angel & Co. Inc., *Pennland,* Antwerp, 4 cs.; Yardley & Co., *American Farmer,* London, 15 cs.; Guaranty Trust Co., *Gripsholm,* Gothenburg, 1,756 rolls, 58 bdls.; National Pulp & Paper Co. Inc., *Gripsholm,* Gothenburg, 182 rolls; Chase National Bank, *Gripsholm,* Gothenburg, 1,366 rolls; Blauvelt Wiley Paper Manufacturing Co., *Gripsholm,* Gothenburg, 60 rolls; Heemsoth Kerner Corp., *Spaarndam,* Rotterdam, 26 cs.; Jay Madden Corp., *Washington,* Hamburg, 192 rolls; M. M. Cohen, *Washington,* Hamburg, 370 rolls, 15 bls.; C. Bloom, Inc., *Washington,* Havre, 1 cs.

FILTER MASSE

J. Manheimer, *Beemsterdyk,* Rotterdam, 25 bls.; ———, *Hamburg,* 5 cs.

FILTER PAPER

H. Reeve Angel & Co. Inc., *Antonia,* London, 11 cs.; Eastman Kodak Co., *American Farmer,* London, 1 cs.; E. H. Sargent & Co., *Gripsholm,* Gothenburg, 3 cs.

DRAWING PAPER

H. Reeve Angel & Co. Inc., *Antonia,* London, 3 cs.; Japan Paper Co., *American Farmer,* London, 2 cs.

SURFACE COATED PAPER

Gevaert Co. of America, *Pennland,* Antwerp, 101 cs.; Gavaert Co. of America, *Black Tern,* Antwerp, 6 cs.

METAL COATED PAPER

Forsmann & Co., *Hamburg,* Hamburg, 8 cs.

COATED PAPER

W. J. Byrnes, *Berengaria,* Southampton, 1 cs.

PHOTO PAPER

J. J. Gavin, *Berengaria,* Southampton, 5 cs.

TRANSFER PAPER

C. Bruning & Co. Inc., *Beemsterdyk,* Rotterdam, 2 cs.; Fuchs & Lang Manufacturing Co., *Hamburg,* Hamburg, 12 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., *Lancastria,* Liverpool, 19 cs. (duplex).

DECALCOMANIAS

Sellers Transportation Co., *Bremen,* Bremen, 2 rolls, 17 cs.

TISSUE PAPER

F. C. Strype, *American Shipper,* Liverpool, 4 cs.; Jay Madden Corp., *Washington,* Hamburg, 81 bbls., 1 cs.

GREASEPROOF PAPER

———, *Gripsholm,* Gothenburg, 134 rolls.

PAPER TUBES

———, *Hamburg,* Hamburg, 20 pkgs.

BOARDS

Miller Paper Co., *Gripsholm,* Gothenburg, 51 bls.

BOOKS AND PAPER

G. E. Stechert, *Paris,* Havre, 9 pkgs.

MISCELLANEOUS PAPER

Hensel Bruckman & Lorbacher, *Bremen,* Bremen, 1 cs.; Japan Paper Co., *Tai Ping,* Kobe, 167 cs.; Jay Madden Corp., *City of Fairbury,* Helsingfors, 26 bbls., 2 cs.; Japan Paper Co., *Hoegh Carrier,* Kobe, 33 cs.; H. C. Davison & Co. Inc., *Hoegh Carrier,* Kobe, 5 cs.; H. Reeve Angel & Co. Inc., *Hoegh Carrier,* Kobe, 6 cs.; Moller Products Corp., *Hoegh Carrier,* Kobe, 25 cs.; F. L. Kramer & Co., *Gripsholm,* Gothenburg, 6 rolls, 206 bls.; ———, *Gripsholm,* Gothenburg, 18 rolls, 43 bls.; Coty Processing Co., *Paris,* Havre, 3 cs.; Japan Paper Co., *Spaarndam,* Rotterdam, 3 cs.

RAGS, BAGGINGS, ETC.

———, *Konigstein,* Antwerp, 112 bls. bagging; H. B.

Franks, *Konigstein,* Antwerp, 250 bls. jute waste; Chase National Bank, *Konigstein,* Antwerp, 106 bls. jute waste; Banco Coml. Italiane Trust Co., *Konigstein,* Antwerp, 89 bls. flax waste; Continental Bank Trust Co., *Beemsterdyk,* Rotterdam, 213 bls. jute waste; Darmstadt Scott & Courtney, *Beemsterdyk,* Rotterdam, 64 bls. bagging; W. Steck & Co., *Beemsterdyk,* Rotterdam, 32 bls. rags; Grace National Bank, *Beemsterdyk,* Rotterdam, 26 bls. rags; E. J. Keller Co. Inc., *Beemsterdyk,* ———, 65 bls. rags; S. Shapiro & Sons, *Silvercedar,* Bombay, 225 bls. cotton waste; O'Brien Padawer Co., *Silvercedar,* Bombay, 225 bls. cotton waste; Railway Supply Manufacturing Co., *Silvercedar,* Bombay, 300 bls. cotton waste; ———, *Silvercedar,* Bombay, 200 bls. cotton waste; Irving Trust Co., *Silvercedar,* Bombay, 216 bls. rags; Castle & Overton, Inc., *Silvercedar,* Bombay, 130 bls. rags; G. M. Graves Co., Inc., *Cameronia,* Glasgow, 62 bls. bagging; Chase National Bank, *Cameronia,* Glasgow, 12 bls. paper stock; Irving Trust Co., *Cameronia,* Glasgow, 19 bls. rags; Irving Trust Co., *Cameronia,* Glasgow, 49 bls. paper stock; ———, *Cameronia,* Glasgow, 84 bls. bagging, 48 bls. paper stock; E. J. Keller Co. Inc., *American Shipper,* ———, 78 bls. paper stock; Chase National Bank, *American Shipper,* Manchester, 112 bls. paper stock; ———, *American Shipper,* Manchester, 79 bls. cotton waste; M. Snedeker Corp., *American Shipper,* Belfast, 76 bls. paper stock; Castle & Overton, Inc., *Examiner,* Alexandria, 135 bls. rags; E. J. Keller Co. Inc., *Examiner,* ———, 278 bls. rags, 155 bls. bagging; Banco Coml. Italiane Trust Co., *Tai Ping,* Kobe, 160 bls. rags; W. Steck & Co., *Tai Ping,* Kobe, 28 bls. hemp waste; ———, *Tai Ping,* Kobe, 100 bls. cotton waste; New England Waste Co., *Tai Ping,* Kobe, 200 bls. cotton waste; E. J. Keller Co. Inc., *Tai Ping,* ———, 100 bls. cotton waste; E. J. Keller Co. Inc., *Tai Ping,* ———, 82 bls. paper stock; Banco Coml. Italiane Trust Co., *Seisho Maru,* Kobe, 60 bls. rags; Philadelphia National Bank, *Seisho Maru,* Kobe, 100 bls. picker waste; Chase National Bank, *Seisho Maru,* Kobe, 400 bls. cotton waste; Continental Bank Trust Co., *Seisho Maru,* Kobe, 100 bls. rags; New England Waste Co., *Seisho Maru,* Kobe, 400 bls. cotton waste; J. J. Ryan & Sons Inc., *Seisho Maru,* Kobe, 100 bls. cotton waste; E. J. Keller Co. Inc., *Seisho Maru,* ———, 341 bls. paper stock, 200 bls. cotton waste; J. Cohen & Son Co. Inc., *Lancastria,* Liverpool, 15 bls. paper stock; Irving Trust Co., *Lancastria,* Liverpool, 17 bls. rags; Chase National Bank, *Lancastria,* Liverpool, 48 bls. rags; ———, *Lancastria,* Liverpool, 104 bls. rags; Royal Manufacturing Co., *Hoegh Carrier,* Kobe, 100 bls. thread waste; Royal Manufacturing Co., *Hoegh Carrier,* Kobe, 50 bls. cotton waste; O. Smith & Sons, *Hoegh Carrier,* Kobe, 100 bls. cotton waste; Chase National Bank, *Hoegh Carrier,* Kobe, 10 bls. rags; Banco Coml. Italiane Trust Co., *Hoegh Carrier,* Kobe, 350 bls. cotton waste; W. Steck & Co., *Hoegh Carrier,* Kobe, 64 bls. rags, 48 bls. hemp waste; Birkenstein & Long, Inc., *Hoegh Carrier,* Kobe, 334 bls. rags; New England Waste Co., *Hoegh Carrier,* Kobe, 500 bls. cotton waste; E. J. Keller Co. Inc., *Hoegh Carrier,* ———, 140 bls. rags, 200 bls. cotton waste; Irving Trust Co., *Pennland,* Antwerp, 279 bls. jute waste; Manufacturers Trust Co., *Pennland,* Antwerp, 89 bls. jute waste; ———, *Pennland,* Antwerp, 309 bls. bagging, 54 bls. rags; Chase National Bank, *Pennland,* Antwerp, 112 bls. bagging; Manufacturers Trust Co., *Pennland,* Antwerp, 46 bls. paper stock; E. J. Keller Co. Inc., *Pennland,* ———, 197 bls. paper stock; Irving Trust Co., *American Farmer,* London, 20 bls. paper stock; ———, *American Farmer,* London, 8 bls. rags; Manufacturers Trust Co., *American Farmer,* Havre, 15 bls. rags; Amtorg Trading Corp., *Kharkov,* Leningrad, 7,258 bls. linters; S. Shapiro & Sons, *Sagoporack,* Copenhagen, 6 bls. rags; R. & V. Miller, *Spaarndam,* Rotterdam, 10 bls. rags; Continental Bank Trust Co., *Spaarndam,* Rotterdam, 113 bls. jute waste; Darmstadt Scott & Courtney, *Spaarndam,* Rotterdam, 40 bls. rags; Leigh Textile Co., *Spaarndam,* Rotterdam, 100 bls. picker waste; First National Bank of Boston, *E. Francqui,* Antwerp, 359 bls. flax waste; Banco Coml. Italiane Trust Co., *Hamburg,* Hamburg, 47 bls. rags; Royal Manufacturing Co., *Norfolk Maru,* Shanghai, 300 bls. cotton waste; Manufacturers Trust Co., *Norfolk Maru,* Shanghai, 100 bls. cotton waste; Brandwein Mazur Co., *Norfolk Maru,* Shanghai, 200 bls. cotton waste; Williamson Procusts Co., *Norfolk Maru,* Shanghai, 100 bls. cotton waste; O'Brien Padawer Co., *Norfolk Maru,* Shanghai, 75 bls. cotton waste; J. J. Ryan & Son, Inc., *Norfolk Maru,* Shanghai, 100 bls. cotton waste; E. J. Keller Co. Inc., *Norfolk Maru,* ———, 100 bls. cotton waste; Royal Manufacturing Co., *Norfolk Maru,* Kobe, 50 bls. cotton waste; New England Waste Co., *Norfolk Maru,* Kobe, 100 bls. cotton waste; F. Stern, *Black Tern,* Antwerp, 234 bls. rags; Foss & Co., *Black Tern,* Antwerp, 43 bls. card waste; Castle & Overton, Inc., *Black Tern,* Antwerp, 83 bls. rags; E. J. Keller Co. Inc., *Black Tern,* ———, 116 bls. bagging; E. J. Keller Co. Inc., *Kano Maru,* ———, 100 bls. paper stock.

WOOD PULP

Pagel Horton & Co. Inc., *Tyrifjord,* Gefle, 2,035 bls. sulphate, 413 tons; Pagel Horton & Co. Inc., *Tyrifjord,* Gefle, 10,000 bls. sulphite, 1,220 tons; ———, *Tyrifjord,* Gefle, 250 bls. sulphite, 50 tons; Stora Kopparberg Corp., *Tyrifjord,* Skutskar, 4,590 bls. dry pulp, 931 tons; Tradesmans National Bank, *Tyrifjord,* Norrsundet, 2,875 bls. sulphite, 617 tons; Tradesmans National Bank, *Tyrifjord,* Norrsundet, 1,250 bls. sulphate, 287 tons; Lagerloef Trading Co., *City of Fairbury,* Wiborg, 1,397 bls. mechanical pulp, 279 tons; Lagerloef Trading Co., *City of Fairbury,* Helsingfors, 710 bls. mechanical pulp, 128 tons; Price & Pierce, Ltd., *Gripsholm,* Gothenburg, 325 bls. unbleached sulphite; D. M. Hicks Inc., *Gripsholm,* Gothenburg, 240 bls. chemical pulp; Bankers Trust Co., *Gripsholm,* Gothenburg, 302 bls. sulphite; Bankers Trust Co., *Gripsholm,* Gothenburg, 279 bls. sulphate; Gottesman & Co. Inc., *Sagoporack,* Stockholm, 1,000 bls. sulphite, 101 tons; Bulkley Dunton & Co., *Spaarndam,* ———, 810 bls. wood pulp; Castle & Overton, Inc., *Hamburg,* Hamburg, 1,750 bls. wood pulp, 470 tons; Gottesman & Co. Inc., *Frode,* Hernosand, 6,000 bls. wood pulp; E. M. Sergeant Pulp & Chemical Co., *Frode,* Hernosand, 2,250 bls. sulphite; Central Hanover Bank Trust Co., *Frode,* Hernosand, 2,550 bls. sulphite; ———, *Frode,* Hernosand, 1,200 bls. sulphite; ———, *Frode,* Hernosand, 300 bls. wood pulp; Price & Pierce, Ltd., *Frode,* Wallvik, 3,000 bls. unbleached sulphate.

National Paper Trade Convention

The office of The National Paper Trade Association announce two prominent speakers on the program for their 34th Annual Convention to be held at the Waldorf-Astoria, New York, February 22-25.

The speaker at the opening session Monday afternoon, February 22, will be Charles R. Stevenson, senior partner of Stevenson, Jordan & Harrison, management engineers, who occupy an outstanding position in the trade organization field. Mr. Stevenson is recognized as a pioneer and one of the wisest and most experienced leaders in his line of work in this country.

Watson M. Gordon, of the advertising agency of Doremus & Co., formerly advertising manager of S. D. Warren Company, will address the Fine Paper Division, Wednesday afternoon, February 24.

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, February 10, 1937.

Trading in the local paper market continues lively. Demand for the various standard grades of paper is well sustained. Some manufacturers are having difficulty in filling orders for immediate delivery. Prices are holding to formerly quoted levels.

The newsprint paper market continues to display strength. Production in the United States, Canada and Newfoundland is being maintained at near capacity to take care of current requirements. There are no undue accumulations at the mills. Prices remain unchanged.

Conditions in the fine paper market are favorable. Demand for book, cover, bond and ledger papers is quite active. Prices are steady to firm. Tissues are moving freely. The coarse paper market is strong. The paper board market is improving materially.

Mechanical Pulp

The ground wood pulp market is exhibiting a strong undertone. Manufacturing operations at home and abroad are proceeding at a good pace to meet prevailing demands. Recently revised quotations on both domestic and imported mechanical pulp are holding up well.

Chemical Pulp

Offerings of the various grades of chemical pulp are limited and the market continues very firm. Bleachable grades of unbleached sulphite are in persistent request and prices are rising. All prime easy bleaching is now quoted at from $2.85 to $3.10, on dock, Atlantic ports.

Old Rope and Bagging

The old rope market is fairly active. Demand for both domestic and foreign old manila rope is normal for the season. The bagging market is moderately busy. While scrap and gunny bagging are rather quiet at present, the outlook for the future is regarded promising .

Rags

Steadiness prevails in the domestic rag market. Demand for the various grades is brisk, including new and old cotton cuttings. No. 1 white shirt cuttings are attracting much interest from domestic and foreign mills. The position of the imported rag market is little changed.

Waste Paper

The bright particular feature of the paper stock market last week was the continued strength of book stock. Stitchless flat stock and over-issue magazines were advanced to from $1.30 to $1.35. Solid flat book is now offered at from $1.20 to $1.30, f.o.b. New York.

Twine

No radical changes were reported in the local twine market. Demand for the various varieties is normal for the time of year. Quotations on both hard and soft fiber twines are generally holding to formerly reported levels.

PREDICTS $47.50 FOR NEWSPRINT

(Continued from page 15)

6 per cent first mortgage bonds; 62,843 6½ per cent cumulative sinking fund preferred shares of $100 par value and 426,832 shares of common stock, $100 par value.

According to the plan of reorganization, the company will issue $15,000,000 of first mortgage bonds, the total authorized issue being $25,000,000.

There will be, further, an issue of $4,263,300 second mortgage 4 per cent convertible debentures.

The debentures have been offered to the common shareholders on record January 3, 1937, on the basis of $10 principal amount of debentures for each common share held, at a price of $98 for each $100 of debentures, with interest accrued from March 1, 1937.

The capital stock will consist of 62,843 authorized shares of 5½ per cent redeemable preferred stock of $100 par value each, cumulative from Jan. 1, 1939, all to be issued.

The common stock will consist of 679,084 authorized shares of no par value, of which 536,807 shares will be issued at once.

Preparatory to this conversion into common shares, the old shares are to be reduced from $100 par value each to $40 par value each.

For each share of common stock presently held, the shareholders will, in effect, receive one new share of common stock without par value. The holder of each of the present preferred shares will receive, in addition to one share of new preferred, one and three-quarter shares of new common stock.

Canadian Lumbermen's Association Elects

N. F. Blair, of Price Bros. & Co., Quebec, was re-elected president of the Canadian Lumbermen's Association at the annual meeting of that body in Montreal. The meeting heard optimistic reports as to the increase in the exports of lumber, and were told that plans were under way for cooperating with the Canadian Pulp and Paper Association in fighting the menace of the sawfly and spruce bud worm.

Physical Testing of Paper

The current Number of "Thwing's Paper Tester," issued by the Thwing-Albert Instrument Company, of Philadelphia, Pa., contains an article on the physical testing of paper, which is the second of a series of articles by a paper technologist of many years experience concerning paper testing.

Western Paper Products Co. Formed

Walter G. Busse announces the establishment at San Francisco of the Western Paper Products Company to serve the Pacific Coast paper dealers. The company will manufacture furniture, mattress, stove and casket bags, special oversize cellulose bags and kindred items from plain papers, creped papers and transparent cellulose.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, February 10, 1937.

BLANC FIXE—The position of the blanc fixe market is practically unchanged. Prices are holding to schedule. The pulp is quoted at from $42.50 to $45 per ton, in bulk; while the powder is selling at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER—Steadiness prevails in the bleaching powder market. Shipments against contract are going forward regularly. The price situation is little changed. Bleaching powder is quoted at from $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN—The casein market continues firm. Domestic standard ground is still quoted at 19½ and standard ground at 20 cents; while Argentine standard ground is also selling at 19½ and finely ground at 20 cents per pound, all in bags, car lot quantities.

CAUSTIC SODA—Business in the caustic soda market is brisk. The contract movement is normal. Prices are firm. Solid caustic soda is quoted at from $2.55 to $2.60; while the flake and ground are selling at from $2.95 to $3 per 100 pounds, in drums, at works.

CHINA CLAY—The china clay market is holding up well. Contract shipments are moving in good volume. Imported china clay is quoted at from $15 to $21 per ton, ship side; while domestic paper making clay is selling at from $6.50 to $12 per ton, at works.

CHLORINE—Conditions in the chlorine market are satisfactory. Demand from the paper mills is excellent. The contract movement is well up to average. Prices are steady. Chlorine is quoted at from $2.15 to $2.25 per 100 pounds, in tank cars, at works.

ROSIN—The rosin market is fluctuating. Paper making gum rosin is now quoted at $9.75 and wood rosin at $9.85 per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent rosin size is selling at $4.16 per 100 pounds, in tank cars, at works.

SALT CAKE—Paper mill demand for salt cake is persistent. Prices remain unchanged. Salt cake is quoted at from $12 to $13; chrome salt cake at from $11 to $12 per ton, at works; while imported salt cake is selling at from $12 to $13 per ton, ship side.

SODA ASH—The soda ash market is exhibiting a strong undertone. Shipments against contract are moving freely. Prices remain unchanged. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.05; in bags, $1.20; and in barrels, $1.50.

STARCH—Trading in the starch market is fairly active. The contract movement is normal for the season. Prices are holding to schedule. Special paper making starch is quoted at $4 per 100 pounds, in bags; and at $4.27 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA—Demand for sulphate of alumina is well sustained. The contract movement is heavy. Prices are firm. Commercial grades are quoted at from $1.35 to $1.60; while iron free is selling at from $2 to $2.25 per 100 pounds, in barrels, at works.

SULPHUR—The sulphur market is steady. Yearly contracts are quoted at $18 per long ton, on orders of 1,000 tons, or over, and $20 on smaller quantities. On spot and near by car loads, the quotation is $21 per ton. All quotations are in car lots, at works.

TALC—Supplies of talc are moving into consumption in moderate volume for the time of year. Prices remain unchanged. Domestic talc is quoted at from $16 to $18 per ton, at eastern mines; while imported talc is selling at from $23 to $30 per ton, on dock.

Market Quotations

Paper

Rag Content Bond & Ledgers—Delivered Zone 1

	Bonds		Ledgers
100% Rag Ext. No. 1	.36		.37
100% Rag	.29	@	.30
75% Rag	.22	@	.23
65% Rag	.19	@	.20
50% Rag	.15½	@	.16½
25% Rag	.13	@	.14

Sulphite Bond & Ledgers—Delivered Zone 1

	Bonds		Ledgers
No. 1 Sulphite	7.65	@	8.65
No. 2 Sulphite	6.75	@	7.75
No. 3 Sulphite	6.25	@	7.25
No. 4 Sulphite	5.50		6.50

Book, B Grade, Cased (f.o.b. mill less carload freight allowed)

S. & S. C.	6.00	@	—
S. & S. C. Litho.	6.25	@	—
M. F.	5.75	@	—
No. 4 Coated and Enamel	7.00	@	—
No. 4 Coated Litho	7.00	@	—

Tissues—Per Ream—

White No. 1	.82½	@	—
White No. 1 M. G.	.77½	@	—
White No. 1½	.62½	@	—
White No. 2	.60	@	—
Anti-Tarnish M. G.	.67½	@	—
Colored	.80	@	—
Kraft	.67½	@	—
Manila	.60	@	—
Unbleached Toilet	2.60	@	3.30
Bleached Toilet	3.94	@	5.26

Paper Towels—

Unbleached	2.10	@	3.35
Bleached	3.30	@	3.70

Manila—

No. 1 Jute	9.00	@	9.25
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00

Fibre Papers—

No. 1 Fibre	4.25	@	5.50
No. 2 Fibre	4.00	@	4.75

(Delivered New York)

News, per ton—

Roll, contract	42.50	@	—
Sheets	47.50	@	—

Kraft—

No. 1 Northern	4.25	@	4.75
Standard	4.12½	@	4.25
Southern	4.00	@	—
Glazed	4.50	@	—
Striped	4.75	@	—

Boards, per ton—

News	42.50	@45.00
Chip	42.50	@45.00
Sgl. Mla. Ll. Chip	52.50	@55.00
Jute Lined Chip	52.50	@55.00
Kraft Liners	67.50	@70.00
White Pat. Coated	65.00	@67.50
Binders Boards	70.00	@75.00

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—		
Moist	33.00	@35.00
Dry	33.00	@35.00
(Delivered)		
No. 1 Domestic and Canadian	33.00	@34.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	2.70	@	3.85
Prime Qualities—			
Class 1 All Prime Easy Bleaching	2.85	@	3.10
Strong Unbleached Sulphite	2.75	@	3.00

(On Dock, Atlantic Ports)

Kraft Bleached	3.50	@	3.75
Kraft Light & Strong	2.30	@	2.90
Kraft No. 1	2.25	@	2.80
Kraft No. 2	2.10	@	2.25
(F.o.b. Pulp Mill)			
Kraft Domestic	2.25	@	2.80
(Delivered)			
Soda Bleached	2.70	@	—

Add 60 cents per short ton, dock charges, for Albany; $2.00 for Lake Ports East and $3.00 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	8.75	@	9.00
Silesias No. 1	6.75	@	7.00
New Unbleached	9.25	@	9.50
Blue Overall	6.75	@	7.00
Fancy	3.00	@	3.25
Washables	2.25	@	2.50
Mixed Khaki Cuttings	3.50	@	3.75
O. D. Khaki Cuttings	4.25	@	4.50

Old Rags

White, No. 1—			
Repacked	3.25	@	3.50
Miscellaneous	2.75	@	3.00
White, No. 2—			
Repacked	2.25	@	2.50
Miscellaneous	1.75	@	2.00
Thirds and Blues—			
Repacked	2.00	@	2.25
Miscellaneous	1.90	@	2.00
Roofing Rags—			
No. 1	Nominal		
No. 2	1.75	@	1.85
No. 3 (bagging)	1.50	@	1.55
No. 4	1.50	@	1.60
No. 5A	1.40	@	1.50

Foreign Rags

New Rags

New Dark Cuttings	2.25	@	2.50
New Mixed Cuttings	2.00	@	2.25
New Light Silesias	5.50	@	5.75
Light Flannelettes	5.50	@	5.75
New White Cuttings	7.00	@	7.50
New Light Oxfords	4.00	@	4.50
New Light Prints	3.00	@	3.25

Old Rags

No. 1 White Linens	7.50	@	8.00
No. 2 White Linens	6.50	@	7.00
No. 3 White Linens	4.50	@	5.00
No. 4 White Linens	2.25	@	2.50
No. 1 White Cotton	4.25	@	4.75
No. 2 White Cotton	3.25	@	3.75
No. 3 White Cotton	2.50	@	2.75
No. 4 White Cotton	1.90	@	2.15
Extra Light Prints	2.00	@	2.25
Ord. Light Prints	1.75	@	1.85
Med. Light Prints	1.55	@	1.65
Dutch Blue Cottons	2.25	@	2.50
French Blue Linens	3.50	@	4.00
German Blue Linens	2.50	@	2.75
German Blue Cottons	2.00	@	2.25
Checks and Blues	2.00	@	2.25
Linsey Garments	2.25	@	2.35
Dark Cottons	2.35	@	2.45
Old Shopperies	1.75	@	2.00
New Shopperies	1.75	@	2.00
French Blues	2.25	@	2.50

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.25	@	2.35
Domestic	2.15	@	2.25
Wool Tares, light	1.75	@	1.85
Wool Tares, heavy	2.10	@	2.25
Bright Bagging	1.70	@	1.75
Manila Rope—			
Foreign	3.00	@	3.25
Domestic	3.25	@	3.50
Jute Strings	2.75	@	3.00
Sisal Strings	2.60	@	2.75
Mixed Strings	Nominal		

Old Waste Papers

(F. o. b. New York)

Shavings			
White Envelope Cuttings	3.20	@	3.30
Ordinary Hard White No. 1	2.50	@	2.60
Hard White No. 2	2.20	@	2.30
Soft White No. 1	2.00	@	2.10
Flat Stock—			
Stitchless	1.30	@	1.35
Over issue Mag	1.30	@	1.35
Solid Flat Book	1.20	@	1.30
Crumpled No. 1	1.00	@	1.10
Ledger Stock	1.30	@	1.35
New B. B. Chips	.45	@	.50
Manila—			
New Env. Cut	2.15	@	2.25
New Cuttings	1.55	@	1.65
Old Kraft Machine—			
Compressed bales	1.60	@	1.70
News—			
No. 1 White News	1.40	@	1.50
Strictly Overissue	.70	@	.75
Strictly Folded	.60	@	.65
No. 1 Mixed Paper	.45	@	.50

RAG CUTTERS

TAYLOR, STILES & COMPANY
TRADE MARK
GIANT
REG. U.S. PAT. OFF.
RIEGELSVILLE, N.J. U.S.A.

CHOPPERS — SHREDDERS

WOOD TANKS

STUFF CHESTS
BLOW PIT
CHEMICAL
ACID
PULP STORAGE
LEAD LINED

ESTABLISHED 1834
WOOLFORD WOOD TANKS
PHILADELPHIA

G. WOOLFORD WOOD TANK MFG. CO.,
PASCHALL P. O., PHILADELPHIA, PA.

INDUSTRIAL TYCOL OILS-GREASES

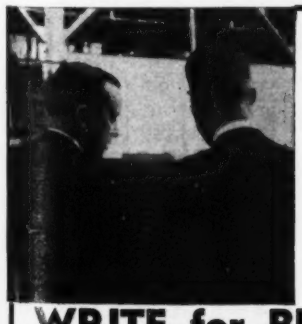
A COMPLETE LINE
SCIENTIFICALLY ENGINEERED
for Every Industrial Use
Tide Water Associated Oil Co.
Incorporated
17 Battery Place, New York, N. Y.

PERFORATED METAL SCREENS

MADE SPECIALLY FOR PAPER and PULP MILL USE
Copper, bronze, steel or other metals. Heat-treated.
HENDRICK MFG. CO.
90 Dundaff St. Carbondale, Pa.
Offices in Principal Cities

HERMAN G. WEBER
Builder of High Speed Bag Machines
Grocery, Duplex, Coffee, Flour, Cellophane Satchel Bottom, Tuber & Bottomers Automatic Compensating Device.
SHEBOYGAN WISCONSIN

PULP MILL MACH'Y FINISHING ROOM MACH'Y
— FRICTION CLUTCHES —
The MOORE & WHITE Co.
PHILADELPHIA, PA.
N. PHILA. STA. PENN'A R.R.
PAPER MILL MACHINERY



Engineers Agree—

that Buffalo Non-Clogging, Hi-Consistency paper stock pumps Cost LESS to operate—LAST LONGER.

WRITE for BULLETIN 953
Buffalo Pumps, Inc. 443 Broadway Buffalo, N. Y.
In Canada: Canada Pumps Ltd., Kitchener, Ont.

YOUR HOME
WHILE IN NEW YORK

One of America's *fine* hotels—unique in its physical characteristics, in its luxurious appointments, and in its deftness of service.

TRANSIENT RATES
Single rooms—$6 to $10 Double rooms—$8 to $12
Suites from $12
MONTHLY RATES ON APPLICATION

THE BILTMORE
David B. Mulligan, *President*
Madison Ave. and 43rd St., New York
Adjoining Grand Central

SHIPPING ROLLS
COUNTER ROLLS
BAG ROLLS

Right off the end of the paper machine with Camachine winders

CAMERON MACHINE COMPANY
61 POPLAR ST. BROOKLYN N. Y.

Twines

(F. o. b. Mill)

(Soft Fibre)

Coarse Polished—

India	.14¼	@	.17¼
Belg. White Hemp	.15¼	@	.19½
India Compress	.15¼	@	.15¾

Fine Polished—

Fine India	.21	@	.23

Unpolished—

Box	.10¾	@	.11¾
Paper Makers	.10½	@	.12¾
Tube Rope	.11½	@	.14
Wall Paper	.12½	@	.13¾
Wrapping	.16	@	.20
Soft Fiber Rope	.13¾	@	.14¾

(Hard Fibre)

Bond	.13½	@	.22
Anchor	.13	@	.14½
Manila	.21	@	.28

PHILADELPHIA

Paper

Rag Content Bond & Ledgers—
Delivered Zone 1

	Bonds		Ledgers
100% Rag Ext. No. 1	.36		.37
100% Rag	.28		.29
75% Rag	.21		.22
65% Rag	.18		.19
50% Rag	.15		.16
25% Rag	.12½		.13½

Sulphite Bond & Ledgers—

	Bonds		Ledgers
No. 1 Sulphite	7.75		8.75
No. 2 Sulphite	6.75		7.75
No. 3 Sulphite	6.00		7.00
No. 4 Sulphite	5.50		6.50

F.o.b. Mill

Book, M.F.	5.00	@	—
Book, S. S. & C.	5.25	@	—
Book, Coated	6.75	@	—
Coated Lithograph	6.75	@	—
No. 1 Jute Manila	10.50	@	—
Manila Sul., No. 1	6.75	@	—
Manila No. 2	4.25	@	—
No. 1 Kraft	6.00	@	—
Southern Kraft	5.00	@	—
News Print Rolls	42.50	@	—
Straw Board	40.00	@	45.00
News Board	40.00	@	—
Chip Board	37.50	@	—
Wood Pulp Board	70.00	@	85.00

Binder Boards—

No. 1, per ton	75.00	@	80.00
No. 2, per ton	70.00	@	75.00
Carload lots	65.00	@	70.00

Tarred Felts—

Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1.	.08	@	.08½
New White, No. 2.	.04½	@	.05
Light Silesias	.05½	@	—
Silesias, No. 1	.04½	@	.05
Black Silesias, soft.	.03½	@	.04
New Unbleached	.06	@	—
Washable, No. 1	.02	@	.02½
Blue Overall	.07	@	.07½
Cottons—According to grades—			
Washable, No. 2	.02½	@	.04½
New Blue	.02	@	.02½
Fancy	.03	@	—
New Black Soft	.04	@	.04½
New Light Seconds	.03½	@	.04
New Dark Seconds	2.00	@	2.25
Khaki Cuttings—			
No. 1 O. D.	.04	@	.04½
No. 2 Mixed	.03½	@	.04
Corduroy	.02	@	.02¾
New Canvas	.04	@	.04½
New Black Mixed.	.02	@	.02¾

Domestic Rags (Old)

White No. 1—			
Repacked	4.00	@	4.50
Miscellaneous	3.00	@	3.50
Thirds and Blues—			
Miscellaneous	2.00	@	2.25
Repacked	2.50	@	2.75
Black Stockings (Export)	4.50	@	5.00
Roofing Stock—			
Foreign No. 1	2.20	@	2.25
Domestic No. 1	1.50	@	1.60
Domestic No. 2	1.40	@	1.50
Roofing bagging	1.10	@	1.20

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	2.00	@	—
Domestic	2.25	@	—
Manila Rope	2.75	@	—
Sisal Rope	2.25	@	2.35
Mixed Rope	1.00	@	1.10
Scrap Burlaps—			
No. 1	2.25	@	2.50
No. 2	1.00	@	1.10
Wool Tares, heavy	3.25	@	3.50
Mixed Strings	1.00	@	1.10
No. 1 New Light Burlap	3.00	@	3.50
New Burlap Cuttings	2.50	@	2.75

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White.	2.30	@	2.40
No. 2 Hard White.	2.10	@	2.20
No. 1 Soft White.	1.90	@	2.00
No. 2 Soft White.	1.40	@	1.45
No. 1 Mixed	—	@	.85
Solid Ledger Stock.	1.50	@	1.60
Ledger Stock, white.	1.30	@	1.35
Ledger Stock, colored	1.00	@	1.10
No. 1 Books, heavy	.90	@	1.00
Manila Cuttings	1.80	@	1.90
Print Manila	.55	@	.60
Container Manila	.55	@	.60
Kraft Paper	1.10	@	1.20
No. 1 Mixed Paper	.45	@	.50
Straw Board Chip	.40	@	—
Binders Board Chip.	.40	@	—
Corrugated Board	.60	@	.65
Overissue News	.75	@	.80
Old Newspapers	.55	@	.60

BOSTON

Paper

Rag Content Bond & Ledgers—
Delivered Zone 1

	Bonds		Ledgers
100% Rag Ext. No. 1	.36		.37
100% Rag	.28		.29
75% Rag	.21		.22
65% Rag	.18		.19
50% Rag	.15		.16
25% Rag	.12½		.13½

Sulphite Bond & Ledgers—
Delivered Zone 1

	Bonds		Ledgers
No. 1 Sulphite	7.65		8.65
No. 2 Sulphite	6.75		7.75
No. 3 Sulphite	6.25		7.25
No. 4 Sulphite	5.50		6.50

F.o.b. Mill

Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.04¾	@	—
No. 2 Kraft	.04¾	@	—

(Delivered New England points)

Southern Kraft	.04	@	—
News Print Rolls	42.00	@	—
Straw Board, rolls	.009	@	35.00
Filled News Board	45.00	@	47.50
Chip Board	42.50	@	45.00
Single Manila Lined Chip	52.50	@	57.50
Single White, Patent Coated News Board (Bender)	65.00	@	70.00
Wood Pulp Board	70.00	@	75.00
Binder Boards (Standard Grade)	70.00	@	—

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White.	2.20	@	2.35
No. 1 Soft White.	1.85	@	2.15
No. 2 Mixed	.75	@	.80
Solid Ledger Books.	1.50	@	1.75
Overissue Ledger Stock	1.30	@	1.50
Mixed Ledgers	.85	@	.90
No. 1 Books, heavy	1.05	@	1.15
No. 1 Books, light	.50	@	.60
Crumpled Stitchless Book Stock	.50	@	.60
Manila Env. Cuttings	1.50	@	1.60
Manila Env. Cuttings, extra quality	1.85	@	1.95
No. 1 Old Manila	.80	@	.85
White Blank News	1.25	@	1.30
No. 1 Kraft	1.40	@	1.45
Mixed Papers	.42½	@	.47½
Print Manila	.60	@	.70
Container Manilas	.27½	@	—
Old Newspapers	.52½	@	.57½
Overissue News	.50	@	.65
Box Board Chips	.40	@	.45
Transmission Rope	1.90	@	2.00
Corrugated Boxes	.60	@	.65
Kraft corrugated boxes	1.15	@	1.20
Screening Wrappers	.60	@	.65

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	3.50	@	3.60
Domestic	3.00	@	3.30
Jute Rope	2.25	@	2.50
Soft Jute Strings	2.50	@	2.62½
Jute Carpet Threads	1.75	@	2.00
Gunny No. 1—			
Foreign	2.25	@	2.35
Domestic	2.10	@	2.20
Bleachery Burlap	4.25	@	4.50
Scrap Burlap—			
Foreign	2.15	@	2.25
Domestic	2.10	@	2.20
Scrap Sisal	2.40	@	2.50
Scrap Sisal for Shredding	2.50	@	2.60
Wool Tares, heavy	2.25	@	2.40
New Burlap Cuttings	2.85	@	3.00
Aust. Wool Pouches	2.90	@	3.00
Heavy Baling Bagging	2.40	@	2.75
Paper Mill Bagging	1.75	@	1.80
Bagging No. 2	1.70	@	—

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	.04	@	.04¼
New White No. 1.	.08¾	@	.09
New White No. 2.	.06	@	.06½
Silesias No. 1	.07¼	@	.07½
New Black Silesias	.04¼	@	.04½
Soft Unbleached	.09¼	@	.09½
Blue Cheviot	.07½	@	.07¾
Fancy	.03¾	@	.04
Washable	.03	@	.03¼
Cottons—According to grades—			
Blue Overalls	.07¼	@	.07½
New Black, soft	.04¼	@	.04½
Khaki Cuttings	.04¼	@	.04½
O. D. Khaki	.04½	@	.04¾
Corduroy	.03¾	@	.03½
New Canvas	.07¾	@	.08¼
B.V.D. Cuttings	.08¾	@	.09

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues	1.75	@	2.00
Thirds and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.62½
Black Stockings	3.90	@	4.00
Roofing Stock—			
No. 1	1.70	@	1.80
No. 2	1.60	@	1.70
No. 3	1.30	@	1.35

Foreign Rags

(F. o. b. Boston)

Dark Cottons	2.25	@	2.30
New White Shirt Cuttings	6.50	@	6.75
Dutch Blues	2.25	@	2.50
New Checks & Blues	2.50	@	3.00
Old Fustians	2.25	@	2.35
Old Linsey Garments	2.65	@	2.85
New Silesias	7.00	@	7.25

CHICAGO

Paper

(F. o. b. Mill)

Rag Bond	.12	@	.40
Water Marked Sulphite Bond	.06¾	@	.11
Sulphite Bond	.05½	@	.07¼
Superfine Writing	.18	@	.24
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07	@	.12
Coated Label	.07	@	.08½
No. 1 Manila	.04¼	@	.05¾
No. 1 Fibre	.04¾	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.03¼	@	.03¾
No. 1 Kraft	4.75	@	5.00
Southern Kraft	3.88	@	4.25
No. 2 Kraft	3.88	@	4.25
Wood Tag Boards	.04¼	@	.06¼
Sulphite Screenings	.03	@	.03¼
Manila Tissue	.05¾	@	.07
White Tissue	.07	@	.09

(Delivered Central Territory)

News, per ton—			
Rolls, contract	42.00	@	—
Sheets, open	47.00	@	—
Boards, per ton—			
Plain Chip	46.50	@	—
Solid News	50.00	@	—
Manila Lined Chip	55.00	@	—
Patent Coated	65.00	@	—
Container Lined—			
85 Test, per 1000 sq. ft.			1.70
100 Test, per 1000 sq. ft.			1.85

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings	1.70	@	2.00
No. 1 Hard White.	1.40	@	1.65
No. 1 Soft White.	1.25	@	1.50
Ledger & Writings	.60	@	.70
Solid Books	.50	@	.60
Blanks	1.00	@	1.05
Krafts	.80	@	.90
New Kraft Cuts	1.20	@	1.30
Manila Env. Cuts	1.25	@	1.30
Ex. No. 1 Manila	.90	@	1.00
Print Manila	.40	@	.50
Overissue News	.40	@	.45
Old Newspapers—			
No. 1 Folded News	.42½	@	.45
No. 1 Mixed Paper	.25	@	.30
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

TORONTO

Paper

Bonds and Ledgers

Delivered

No. 1 White	.35½	@	—
No. 1 Tints	.36½	@	—
No. 2 White	.26½	@	—
No. 2 Tints	.27½	@	—
No. 4 White	.14½	@	—
No. 4 Tints	.15½	@	—
No. 5 Bond—White	.10¾	@	—
No. 5 Bond—Tints	.11¾	@	—
No. 5 Bond — Golden Rod	.12¾	@	—
No. 5 Ledger—White	.11¼	@	—
No. 5 Ledger—Tints.	.12¼	@	—
No. 6 Bond—White	.10	@	—
No. 6 Bond—Tints	.10½	@	—
No. 6 Bond—Golden Rod	.12	@	—
No. 7 Bond—White	.08¼	@	—
No. 7 Bond—Tints	.08¾	@	—
No. 7 Bond—Golden Rod	.10¼	@	—

Book—

No. 1 M. F.	6.50	@	6.75
No. 2 M. F.	6.25	@	6.50
No. 3 M. F.	5.00	@	5.35
No. 1 S. C.	7.00	@	7.50
No. 2 S. C.	6.50	@	7.00
No. 3 S. C.	5.50	@	6.00
No. 1 Coated and Litho	12.00	@	—
No. 2 Coated and Litho	10.50	@	—
No. 3 Coated and Litho	9.50	@	—
Coated tinted	13.00	@	—
Wrapping—delivered—			
Rag Brown	4.75	@	—
White Wrap	3.50	@	—
"B" Manila	4.80	@	—
No. 1 Manila	5.40	@	—
Fibre	5.40	@	—
Kraft, M. F.	5.90	@	—
Kraft, No. 2	5.40	@	—

(F. o. b. Cars Toronto)

News, per ton—			
Rolls (contract)	Nominal		
Sheets	Nominal		

Pulp

Ground wood	28.00	@	—
Unbleached Sulphite	46.00	@	—
Book (Class 1)	60.00	@	—
Writing (Class 2)	61.00	@	—
Select (Class 3)	62.00	@	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut.	2.00	@	2.25
Soft White	1.60	@	1.90
White Blk. News	1.25	@	1.40
Book and Ledger—			
Flat Magazine and Book Stock (old)	.80	@	.90
Light and Crumpled Book Stock	.70	@	.80
Ledgers and Writings	.90	@	1.00
Manilas—			
New Manila Cut.	1.20	@	1.40
Printed Manilas	.55	@	—
Kraft	1.00	@	1.60
News and Scrap—			
Strictly Overissue	.60	@	—
Strictly Folded	.55	@	—
No. 1 Mixed Paper	.45	@	—

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.07	@	.08¼
Fancy Shirt Cuttings	.03	@	.03½